JUL 31 1934
PERIODICAL DIVISION

JULY 14, 1934.

THE LANCET

Offices: 7, ADAM STREET, ADELPHI, W.C.2.
Telegrams: LANCET, RAND, LONDON. Telephone: TEMPLE BAR 7228 and 7229

No. II. OF VOL. II., 1934. LONDON, SATURDAY, JULY 14, 1934 Pp. 112—Price 1s.
No. 5785. Vol. CCXXVII. Founded 1823. PUBLISHED WEEKLY. Registered as a Newspaper. Annual Subscription: Inland £2 2s. Abroad £2 16s.

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VIRUSES IN RELATION TO THE ÆTIOLOGY OF TUMOURS*

By C. H. Andrewes, M.D., M.R.C.P. Lond.

MEMBER OF SCIENTIFIC STAFF, NATIONAL INSTITUTE OF MEDICAL RESEARCH

This subject, the ætiology of tumours, is rather far removed from those dealt with by previous Oliver-Sharpey lecturers. It is also one which has tended to engender unnecessarily bitter arguments amongst those who discuss it. Nevertheless it seems to me that the parasitic theory of cancer needs to be carefully reconsidered in the light of our growing knowledge about viruses; and some recent work I shall have to refer to makes the subject particularly ripe for discussion at the present time.

I do not propose to attempt the difficult feat of providing proof that mammalian tumours are caused by viruses: that is something which cannot be done to-day. I shall content myself with a more limited but quite definite objective, that of persuading you that the parasitic hypothesis of cancer is not dead but very much alive. I shall try to show that many of the known facts about tumours are *consistent* with the view that the behaviour of tumour cells is essentially due to infection of those cells by a parasitic virus: further, that certain facts are difficult to reconcile with any other view. On the other hand, I shall have to discuss certain features of neoplasms which are very hard to explain on the virus hypothesis and to consider several attempts which have been made to reconcile apparently discordant facts.

Let us first inquire why viruses are worth considering at all in relation to tomours. Cancer has been considered as a parasite since the earliest times, and many would still so consider it, regarding the cancer cell itself as of parasitic nature. But with the discovery of bacteria and protozoa in the last century there began to appear a host of claims that specific micro-organismal parasites had been seen in or cultivated from tumours. None of these claims has stood the test of time and interest in the parasitic theory of cancer has accordingly waned. Recently, however, the theory has arisen once more, phœnix-like, in the form of what is called the virus hypothesis. It is widely believed that the viruses constitute a group of very small organisms adapted to a parasitic existence within cells of animals and plants, and this conception has naturally excited interest once more in the possibility of a relationship between the viruses and benign and malignant neoplasms.

Filtrable Tumours of Fowls

In considering this subject we naturally think first of all of the filtrable fowl sarcomata. In 1910 began to appear the studies of Rous and Murphy and their associates on fowl sarcomata, tumours which are transmissible by means of cell-free filtrates. But the seed fell upon stony ground and no general interest was taken in their observations. The edition of Ewing's well-known "Neoplastic Diseases" published in 1919 contains a 13-page chapter on "the parasitic theory of cancer" in which the word "virus" does not occur. Rous's sarcoma is dismissed elsewhere in the book as a disease sui generis.

But during the last decade interest in the filtrable fowl tumours has steadily increased. The salient facts about these tumours are as follows. In general they resemble mammalian sarcomata, infiltrating locally and metastasising to distant parts of the body; reasons for believing them to be true tumours will be discussed presently. They are of several different histological types including spindle-celled sarcoma, osteochondrosarcoma, endothelioma and so on, covering all the range of mammalian connective tissue tumours. No filtrable epithelial fowl tumour has, however, been described as yet. The best-known fowl tumour is the Rous No. 1 spindle-celled sarcoma.[1] In view of the many different tumours which have now been described it is incorrect to speak of all filtrable fowl tumours as Rous sarcomas or Rous tumours; such a terminology suggests that all are alike. These growths differ essentially from mammalian tumours in one property: they can be transmitted by filtrates or desiccated material containing no formed cell-elements. The active agent in these filtrates or desiccates is generally regarded as a virus; its claims to be considered as such will be discussed later. The fowl tumours differ also from mammalian growths in that some of them will grow progressively when inoculated into adults of a foreign host, such as pheasants or ducks. Mammalian neoplasms cannot be propagated in a foreign species unless very young animals are used.

The importance of these tumours rests largely on the fact that their existence renders untenable most of the arguments which had been built up to show that the parasitic theory of cancer *could* not be true. These arguments ran along lines such as these: the age-incidence of cancer is unlike that of parasitic diseases; the anatomical and physiological characters of cancer tissue differ from those of infectious processes; abnormally large size of cell and nucleus, so common in cancer, is not the rule in inflammation; a cancer continues to grow at the expense of the body in a way which has no parallel in any other condition; the fate of metastases of cancer is entirely different from that of infective emboli; tumour tissues are transplantable to a new host in a manner unlike that of any other tissues, and so on. Rous's work showed that fowl tumours which were produced by the action of a virus-like agent resembled classical tumours in all of the points discussed. In other words, all these theoretical objections to a parasitic theory of cancer fell to the ground.

One not infrequently hears this argument: it is agreed that a virus may cause certain tumours, but this finding is considered to be on the same footing as the causation of tumours in rats affected by worm-infestation or the production of epitheliomata in mice by tar and other chemical agents. "Viruses, worms, tar—all these agents can produce cancer. Why not maintain that all tumours are caused by worms; it is as reasonable as postulating a virus for every new growth!" Those who reason thus miss the essential differences between the rôle played by the virus and the rôle of, let us say, the tar. The tar only produces tumours after a long latent period; the virus of the Rous sarcoma acts almost immediately, and malignant changes can be seen only a few days after inoculation. Again, tar acts only by initiating a cancerous change; it is not multiplied in the growth nor recoverable from metastases or transplanted tumours; the fowl tumour viruses multiply as the tumour multiplies and can be obtained from it after many transplantations. The

* The first Oliver-Sharpey lecture for 1934, delivered before the Royal College of Physicians of London on May 1st. The second lecture will appear next week.

virus thus appears to produce malignant transformation of cells directly, immediately, and continuously; the tar, worms, and other agencies have every appearance of acting only indirectly and only at the beginning of the process.

ARE FOWL TUMOURS TRUE NEOPLASMS?

There have, however, been some who have denied that the fowl tumours are true new growths. Rous and his colleagues have ably summarised the reasons for regarding them as true tumours; they point out that they resemble these in all the following respects: they grow into other tissues by infiltration; their growth is independent of the needs of the host and is ultimately to its detriment; they metastasise apparently only through the agency of cells; and the disease remains strictly localised apart from definite metastases. The fowl tumours are like mammalian growths also in their mode of regression in resistant hosts; in transplantability to other hosts; in the special methods by which grafts become vascularised; in the difficulty of transplanting from the primary tumour and subsequent increase in malignancy on passage; and in a number of other ways too numerous to recount now.

Goodpasture [2] recently tried to dismiss the fowl tumours from the category of true neoplasms on the grounds that the so-called metastases were only infections of distant parts of the body by the tumour agent and not due to transport of cells by vascular channels. Such an argument cannot be long maintained if one takes the trouble to study the careful work done by Rous on his tumour No. 1 to settle this point. He found that filtrates inoculated intravenously did not produce growths in the lungs, liver, and heart—which are the sites of election for metastases in tumour-bearing birds. Often no tumours at all were produced; when they did appear their location seemed to be determined by the presence of local tissue injury; they occurred not infrequently in the functioning ovary. Possibly access to susceptible cells was not possible where the lining of the vessel wall was intact. Further, by histological studies Rous [1] showed that tumour cells could penetrate vessel walls and that strands of tissue might be found within the lumen of a vessel. Secondary growths in viscera were found to consist of small groups of cells with a blood-vessel in the midst occluded by tumour tissue. Murray and Begg [3] have shown that with a fowl endothelioma (MH2) also the lesions in distant organs are true metastases. This is the sort of evidence from which conclusions as to the nature of the metastases of mammalian cancers have been drawn.

It has been urged that the filtrable fowl tumours may represent a disease sui generis, distinct from true tumours of birds. The widely differing histological types of growth which have been found make it difficult to consider the filtrable tumours as "a" disease. Still more important are the facts that all fowl tumours which have been carried on for some time and have grown freely have ultimately proved filtrable. Murphy and Landsteiner's [4] tar sarcoma was, however, propagated for three years without being successfully filtered.[5] On the other hand the Mill Hill 1 fibrosarcoma of the Imperial Cancer Research Fund was propagated for about three years before its filtrability was established.[6] But filtrability and regular easy propagation have been found to go hand in hand. Thus, the Rous No. 1 sarcoma has gone through phases of poor growth in which its filtrability has been temporarily lost.[7] Proved filtrability of an epithelial fowl tumour would be of great interest. Unfortunately it has not been possible to study the point as no fowl carcinoma has yet been transmitted in series for more than a few transfers. It is pertinent to emphasise in this connexion, as Cramer [8] has done, that a filtrate of an epithelial tumour should not be tested for infectivity by intramuscular injection as is done with sarcoma filtrates; it would have to be placed in direct contact with normal epithelial cells, which alone are likely to be susceptible to infection.

INDUCED FILTRABLE TUMOURS

Those interested in the relations between avian and mammalian growths have naturally wondered whether tar and similar carcinogenic agents active in mammals would produce tumours in birds and, if so, whether these would be filtrable. Quite recently attention has been directed to 1:2:5:6 dibenzanthracene and other pure chemical carcinogenic compounds studied by Kennaway and Cook at the the Cancer Hospital.[9] The substances are of very great interest, particularly as some of them have been shown to have chemical affinities with sex hormones on the one hand and with vitamin D on the other.

There is no doubt that both tar and the dibenzanthracene will produce sarcomata in fowls; the question of filtrability of such tumours is not yet finally settled but it is being studied in a number of laboratories and we shall doubtless know the answer before long. Already there is some evidence which strongly suggests that tar tumours in fowls will prove to be propagable, like other fowl tumours, by a cell-free agent. Such a finding would serve to clear the ground of a large number of superfluous cancer theories. One could hardly conceive that tar—and this applies with still greater force to a definite chemical compound—could incite malignant changes in fowls through the agency of a filtrable virus, and in mammals by an entirely different mechanism. The attempt to ascribe a wholly different ætiology to avian and mammalian tumours would break down. As to further implications of the finding, there is, of course, still room for discussion. Some argue that the finding of a virus in tar-induced bird tumours would be strong evidence that a virus existed in mammalian tar cancers also but was not readily demonstrable. Others reach, from the same data, an essentially opposite conclusion: a filtrable tumour, they say, produced by tar in a virus-free bird is good evidence that the agent of the Rous tumour is, after all, not a virus. A crucial question is now seen to be the nature of this active agent in fowl tumour filtrates; this must, however, be left to the second lecture.

The available facts concerning tar tumours in fowls will now be summarised. Murphy and Landsteiner,[4] who first studied this question, obtained one tar sarcoma in a fowl but during three years of study filtrates were always inactive. With Leitch,[10] also, tumours appeared in three tarred birds but these were propagable with great difficulty. Gye,[11] and also Peacock [12] in his earlier experiments, found that tars which were highly carcinogenic in mice would not give rise to many tumours in fowls. On the other hand, Carrel, using tar,[13] arsenious acid,[14] and indol [15] —all known as carcinogenic agents—obtained tumours which were like Rous No. 1 highly malignant from the first and readily filtrable. He only reported, however, the occurrence of one or two tumours after treatment with each agent and his results have been criticised, in my opinion rightly, by Begg and Cramer.[16] They point out that he was working in a laboratory where the Rous virus was being studied and that a propagable tumour which from its inception has the

malignancy of those he describes is almost unknown. The production with tar or arsenic of filtrable tumours in single birds is also reported by Fischer,[17] Laser,[18] White,[19] and Haagen.[20] Obviously in a world where spontaneous filtrable fowl tumours occur, and particularly in laboratories where such tumours are under study, one cannot draw too sweeping conclusions where a worker has only obtained one filtrable tumour after injection of a chemical substance.

More recently Peacock [12] has shown that sarcomata appear in a high proportion of fowls injected with a particular tar which is not the most highly carcinogenic in mice. Further, he and also Burrows [21] and Gye and Purdy [11] have found that 1 : 2 : 5 : 6 dibenzanthracene is very potent in inducing sarcomata in fowls. The tumours produced have not yet been proved filtrable; indeed most of them are not even propagable by means of cells. This last feature they of course have in common with other spontaneous tumours of fowls: Rous and his collaborators could only transmit 5 of the 40 odd tumours which came under their notice.

The most recent paper is that of McIntosh.[22] He injected fowls with carcinogenic tar, and tumours appeared in a large number of them, a far higher proportion than he had ever encountered in fowls not treated with tar. A number of the tumours were propagated for several generations and three of them proved readily filtrable; two of these he classifies as fibro-angio-endotheliomata, the third as a fibrosarcoma. McIntosh's evidence is the best yet produced that tar tumours in fowls are filtrable; but more work is needed before the matter can be considered as beyond doubt. Most of the tumours in McIntosh's tarred birds appeared at sites other than the breast muscle where the tar was injected, for instance, in the liver, lungs, or heart. Of the three growths found ultimately to be filtrable only one had its origin in a tumour appearing at the site of tar injection. Further, many of his fowls also developed leukæmia; now, Oberling and Guérin [23] and also Furth [24] have described strains of fowl leukæmia which give rise to endotheliomatous tumours in a proportion of inoculated birds. Are we to believe that the tarring rendered McIntosh's fowls generally and not only locally susceptible to the development of malignant changes? The facts seem to indicate as much; and yet Peacock [12] and Gye and Purdy [11] by injecting dibenzanthracene and another variety of tar obtained their tumours always in close relation to the site of inoculation. Clearly our only safe deduction at present is that the importance of the points at issue demands further intensive work.

I have dealt at some length with the fowl tumours because their existence constitutes the most important reason for seriously considering viruses in connexion with cancer. There are, however, other though less cogent reasons for doing so.

Inclusion Bodies in Cancer

In many virus diseases there occur intracellular masses, usually eosinophil, in the nucleus or cytoplasm—the so-called inclusion bodies. Their appearance in certain virus infections is so characteristic as to be of diagnostic value. Some of the cytoplasmic bodies seem to consist of masses or intracellular colonies of virus particles themselves. The nature of the intranuclear inclusions, on the other hand, is still doubtful, but many of them conform to a general type. Thus one sees in sections stained by hæmatoxylin and eosin a pink mass in the centre of the nucleus separated by a clear halo from the basophilic chromatin which collects at the periphery. Such appearances are seen in nuclei affected by herpes simplex, herpes zoster, chicken-pox, and many virus diseases of animals. Inclusion bodies have repeatedly been described in cancerous lesions, particularly the cytoplasmic "bird's-eye" inclusion which was at one time thought to represent a protozoan parasite. These are now believed to be caused either by retention of secretions in glandular cancers or by some morbid change in the centrosomes.

Recently Dorothy Russell [25] has found in 33 per cent. of human gliomata intranuclear inclusions having the general appearances described above as characteristic of certain virus diseases. Her results have lately been confirmed in America by Wolf and Orton.[26] She concludes "the observations recorded are compatible with their being expressions of virus infection. If they are such their frequency in the gliomas points to a virus being the cause of these growths." Unfortunately, even proof that they were genuine virus inclusions would not finally decide whether a virus was the cause of the gliomata. There is a virus which infects laboratory rabbits, particularly in America, and known as virus III. On inoculation into a rabbit it produces acute local infection and then is apparently killed off. But in the rabbit carcinoma described by Brown and Pearce this virus was found by Rivers and Pearce [27] to persist indefinitely; it has been hard to obtain tumours free from the virus. Virus III. is carried along in the tumour as it is transplanted from one rabbit to another; in experiments which I have never published I was able to carry virus III. in this way through a rabbit which had been previously immunised against it. In recently transplanted tumours, but not in older ones, intranuclear inclusions characteristic of infection with virus III. may be found. After some trouble Rivers and Pearce did succeed in separating the virus from the tumour and showing that they were not ætiologically related. Knowledge that a virus can persist like this in a tumour will make us hesitate to draw conclusions from finding inclusion bodies in growths. Possible reasons for the ability of a virus to persist in a neoplasm in this way will become clearer later when we come to consider some general properties of viruses.

During the present year Lucké [28] has published some interesting observations on tumours in the North American leopard frog (*Rana pipiens*). Adenocarcinomata were found by him in the kidneys of as many as 2 per cent. of frogs coming from parts of Vermont: frogs from other districts had no kidney tumours. These carcinomata infiltrated locally but did not metastasise. Their interest to us at the moment is that most of them showed numerous intranuclear inclusions of the type we have been discussing. In some, as many as 75 per cent. of the nuclei of the tumour cells contained these bodies. Lucké is cautious in drawing conclusions as to a possible causative relationship between a virus and these growths, being aware of the work of Rivers and Pearce just referred to.

Evidence for an Extracellular Agent in Mammalian Tumours

The great bulk of evidence supports the view that tumours of mammals grow entirely by multiplication of cells already malignant. Nevertheless through the literature one repeatedly finds suggestions that this is not always so; evidence for induction of malignancy in cells adjacent to a tumour is reported by many workers (Adami,[29] Deelman [30]). The evidence is unconvincing, it is true, but it must be remembered that histological examination of transplanted fowl

tumours gives no clue to suggest that in them either is there an extracellular agent. The rare cases of carcinoma sarcomatodes, instances of apparent malignant transformation of the stroma of an epithelial tumour may be significant.

MOUSE SARCOMA 37S

In one of the Imperial Cancer Research Fund's mouse carcinomata (37) such a transformation of stroma apparently occurred, and from this has been obtained a sarcoma known as 37S. Workers with this tantalising tumour seem always on the point of showing that it can be transmitted by a cell-free agent, but the evidence is never quite convincing enough. First, Gye [31] found that one strain of this tumour (polymorph 37) would grow in very young rats in a free manner not usual with heteroplastic grafts. He did not provide proof, however, that the tumours consisted of rat cells and not of mouse cells. Secondly, it was reported, again by Gye,[32] in 1925 that Berkefeld filtrates of diffusates of 37S would produce sarcomas in mice. These experiments appeared conclusive; unfortunately neither Gye nor other workers have been able to repeat them. It is conceivable that, just as Rous No. 1, usually filtrable, passes through phases of poor growth and non-filtrability, so 37S, usually non-filtrable, occasionally reaches maximal virulence and is then filtrable. Unless and until the tumour can be filtered again we cannot decide. Thirdly, Cramer [8] found in 1930 that 37S, unlike mouse carcinomata, would still produce tumours after being frozen and thawed eight times; he could obtain no evidence that living cells were present after this treatment. Gye and Purdy,[33] however, investigating histologically the fate of grafts of such material, thought it probable that some cells were living after four freezings and thawings. Fourthly and lastly, Tinozzi [34] produced tumours by inoculating into other mice minced embryos taken from pregnant mice bearing 37S sarcomata; he believed that transplanted cells could not be held responsible for the growths, particularly as the placentæ gave negative results.

The Natural History of Viruses

We must turn aside for a short time to consider some general properties of viruses in an endeavour to see whether viruses can reasonably be expected to be capable of giving rise to tumours. Such digression may seem unnecessary since I have already argued that some viruses, those of the fowl sarcomata, not only might reasonably be expected to cause but actually do cause true new growths. The matter is, nevertheless, important to discuss in view of the doubts to be dealt with later as to whether the fowl tumour agents are really viruses. Most virus diseases are short, acute, self-limited infections; measles, mumps, chicken-pox, and small-pox at once occur to the mind. Is it or is it not reasonable to seek for the cause of cancer amongst agents producing infections of such a type?

INTRACELLULAR HABITAT OF VIRUSES

It seems fairly certain that many viruses multiply within the cells of the host. The cytoplasmic inclusions of many viruses of the pox group consist of aggregations of particles which probably represent the virus bodies themselves. The studies of Borrel,[35] Goodpasture,[36] and of Barnard [37] on the viruses of fowl-pox, canary-pox, and ectromelia (a virus disease of mice) may be quoted. The antibodies in resistant animals which neutralise viruses possibly act by altering their physical state so that they cannot penetrate or infect susceptible cells. In any case, it appears that once a virus is inside a cell, antibody in the fluids outside the cell is unable to neutralise it nor to prevent it from multiplying. This has been shown by studies of viruses (herpes simplex, virus III., yellow fever) growing in tissue cultures. Certain viruses will produce characteristic inclusion bodies in cells infected in vitro in tissue cultures. If the tissues are suspended in immune serum no infection of the cells can take place; but if virus is given opportunity to infect the cells before antiserum is added, then the typical inclusion bodies are able to develop (Andrewes,[38 39] Haagen [40]). Rous, McMaster, and Hudack [41] have lately shown the same thing more directly. Suspensions of rabbit fibroblasts were obtained by digesting tissue cultures with trypsin. The viruses of vaccinia and of Shope's rabbit fibroma (to be mentioned shortly) were adsorbed to these cells. The virus-treated cells were then suspended in antisera for the respective viruses and later washed. It was found that the sera had been unable to neutralise the viruses adsorbed to the cells, while virus unprotected by cells was quickly inactivated. Similarly Perdrau and Todd [42] found that many viruses were inactivated by methylene-blue in the presence of light. Virus in cell suspensions from infected tissues was, however, protected by its intracellular position from this photodynamic destruction.

These facts have a definite bearing on the virus theory of tumours. We have to explain why a hypothetical cancer virus is not destroyed by neutralising antibodies as the viruses of measles and chicken-pox presumably are during convalescence. If our cancer virus were to exist in a state of equilibrium with the parasitised cell, stimulating it to divide but not destroying it, it would clearly never have to come into the open where antibodies could get at it. Secure in its stronghold it could defy the dangers without.

A possible reason for the persistence of virus III. in the Brown-Pearce rabbit tumour is now apparent. If cells in such a tumour are multiplying rapidly enough, extraneous viruses in the cell may find themselves carried to daughter and then to grand-daughter cells, yet not necessarily reaching a high enough concentration to produce cell death. They need thus never be brought into contact with the immune serum which could eliminate them from the scene of action.

At this point I must digress for a few moments in order to avoid possible misconceptions. We have had to consider immunity to viruses in our endeavour to understand how viruses could cause new growths. But immunity to tumours is probably a complex phenomenon, by no means to be wholly explained in terms of immunity to a virus. Much work has been done on immunity to transplanted tumours in mammals, which is really a question of immunity against the cells of a foreign individual and does not greatly concern us to-day. Then there has to be considered the mechanism by which regression of established new growths occurs. Relative immunity to a tumour virus itself may also be involved, perhaps in determining whether a spontaneous tumour does or does not arise at all.

Many clinical and experimental data are available bearing on immunity to tumours; for instance, there is the vexed question of whether multiple primary new growths occur with more or less than the expected frequency. But these and other facts are of such doubtful interpretation that they seem at present hardly relevant to a discussion of the virus hypothesis.

Pathological Changes Produced by Viruses

The lesions which viruses produce consist firstly, of changes in the cells which are primarily attacked, and, secondly, of the inflammatory reactions which follow.

We are at present concerned only with the primary response of the parasitised cells. In these, viruses cause either proliferation or necrosis or, very often, proliferation accompanying or followed by necrosis. One also sees in many instances the formation of cytoplasmic or intranuclear inclusion bodies, and these inclusions may be found, as in vaccinia and fowl-pox, in cells actually engaged in mitosis. Often the proliferation is early and comparatively slight: necrosis sets in quickly. With other viruses the proliferative changes dominate the picture. Proliferation and necrosis are, of course, seen in many inflammatory conditions caused by bacteria or by non-living agents; their interest in virus diseases depends upon the evidence that in these instances they are caused by a parasite within the cell.

One can point to examples of every type of change produced in cells by the action of a virus, from pure necrosis to almost pure proliferation. If one agrees provisionally to consider tumours as a group of virus diseases one can construct in this way an ordered series of virus lesions extending from small-pox to cancer. The cell involved may be epithelial or of connective tissue origin. It happens that at the "tumour end" of our scale we find a more beautifully graded series amongst the disorders of the connective tissues; at the other end the infections of the epithelial cells are better represented (see Table). Nevertheless, it will be better to consider the two series separately to start with.

Necrosis to Neoplasia

Epithelial series.	*Connective tissue series.*
Foot-and-mouth disease.	Canary-pox.
Vaccinia.	Vaccinia.
Fowl-pox. Sheep-pox. Molluscum contagiosum.	Infectious myxoma (rabbit).
Filtrable warts (man, dogs, cattle).	Infectious fibroma (cottontail).
Filtrable warts (rabbits).	Fujinami sarcoma (duck).
Non-filtrable papillomata.	Fujinami sarcoma (fowl).
Rodent ulcer.	Rous sarcoma No. 1.
Malignant epithelioma.	Mill Hill 1 fibrosarcoma.
	Non-filtrable fowl sarcoma.
	Mammalian sarcoma.

FROM NECROSIS TO NEOPLASIA: THE EPITHELIAL SERIES

Foot-and-mouth disease affords an example of a virus which produces in the cells attacked necrosis almost without preliminary proliferation. Small foci of epithelial cells become degenerated, and the spreading of this necrosis gives rise to the formation of a vesicle.

The lesions produced by vaccinia show varying combinations of cell destruction and multiplication. In the rabbit's testis the virus produces necrosis of epithelium without proliferative lesions. In the skin of the calf the degenerative process is almost unaccompanied by proliferation. But on the cornea of the calf or rabbit lesions of both types are seen. Within a few hours after inoculation one can find enlargement of individual epithelial cells and also mitotic and amitotic multiplication. The intracellular Guarnieri bodies also appear in many cells within a few hours. After a few days degenerative changes are more evident and many of the cells containing Guarnieri bodies have been engulfed by normal epithelial cells. Proliferative processes in this instance seem to precede degeneration, but the exact relations of the two are hard to disentangle.

In fowl-pox also we find multiplication of affected cells preceding destruction. So great is the growth of tissue here that nodules of considerable size are formed; hence the name epithelioma contagiosum. After the initial proliferative changes, inclusion bodies, larger than those of vaccinia, appear in the cells, which themselves become much enlarged. Mitosis, however, may still occur in cells containing these bodies. Finally the cells are killed and degenerative changes predominate. The lesions of human molluscum contagiosum bear a close resemblance to those of fowl-pox. The visceral lesions of sheep-pox are at first sight extraordinarily suggestive of a neoplastic process (Bosc,[43] Borrel [44]); they take the form of adenomatous nodules in the stomach, lungs, and even in the mammary gland of the affected sheep. Inclusion bodies occur in the cytoplasm of the proliferating epithelial cells and numerous mitoses may be found, many of them atypical. The alveoli in the pulmonary lesions are full of swollen cells apparently formed from multiplication of altered cells lining their walls.

Infectious warts of man have their parallel in similar conditions in dogs and cattle. Here we find that the lesions, which again are caused by a filtrable agent, are for some time entirely proliferative. There is no general agreement as to whether inclusion bodies are present in human warts. After growing for some time, warts, both in man and in dogs, are apt to regress rather suddenly, and the host is then commonly immune to reinoculation. Shope [45] has described "infectious papillomatosis" as occurring in wild cottontail rabbits in America. While the warts of man and dogs have not been proved to be transferable to species other than their natural hosts, Shope succeeded in infecting domestic rabbits with his cottontail warts. (The domestic rabbit is of a different genus from the cottontail.) Cottontail warts are perhaps one stage nearer a true tumour than are other warts, for they seem to go on growing indefinitely, showing so far as is yet known neither a tendency to regression nor to the development of malignancy†; they may become as large as a human fist. While Shope readily infected domestic rabbits with material from cottontails, he found great difficulty in transmitting these warts in tame rabbits, rapidly though they were growing, to other tame rabbits. He points out that in so far as they are—in the tame rabbit—not filtrable and not even propagable by grafting they are exactly comparable with many spontaneous epithelial tumours of mammals.

It will not be hard to continue the series of epithelial growths from the progressive cottontail papilloma, through various non-filtrable papillomata of man and animals, till we reach those of local malignancy, such as a rodent ulcer and finally a fully malignant human epithelioma. The suggestion that epithelial new growths do not necessarily constitute a class apart from other disorders of epithelial cells was made over thirty years ago by Borrel.[44] In an admirable paper entitled Infectious Epithelioses and Epitheliomas, published in 1903, he compared the proliferative lesions of vaccinia, sheep-pox, and molluscum contagiosum with those of mammary cancer in the mouse.

FROM NECROSIS TO NEOPLASIA: THE CONNECTIVE TISSUE SERIES

When we turn to the virus diseases attacking the connective tissues we naturally find it harder to distinguish between the primary injury inflicted by a

† Since this lecture was delivered a note by Rous and Beard has appeared in Science (1934, lxxix., 437); they report that warts grafted as autoplasts into the internal organs of rabbits show many of the features of malignancy.

virus on the cells and the results of the secondary inflammation. Accumulation of wandering cells and multiplication of various types of cells, both mobile and fixed, makes us chary of maintaining that the specific stimulus of a virus has led to proliferation of one type of connective tissue cell; and clearly it is only a definite stimulation of one type of cell which we can compare with a tumour; anything else would have to be classed as an infective granuloma.

As an example of a virus producing necrosis of connective tissues we may point to the canary virus described by Kikuth and Gollub [46] and shown by Burnet [47] to be related to fowl-pox. This virus attacks epithelial as well as connective tissues; on subcutaneous or intramuscular inoculation it produces acute local œdema and necrosis. The involved mononuclear cells show vacuolation and there is little doubt that the virus multiplies locally in them.[47]

The lesions of vaccinia also are not confined to epithelial structures. With at any rate some strains of the virus, proliferation of endothelial cells is a striking feature of the histological picture. This is seen in the small vessels in a skin lesion, and in the spleen and the so-called lung pocks of generalised vaccinia in the rabbit. Endothelial proliferation occurs, however, in so many pathological conditions that one hesitates to stress unduly these vaccinial lesions; there is no certainty that the virus is multiplying in the affected cells.

Infectious myxoma of the rabbit is a highly contagious fatal disease of rabbits first described from South America. But besides acute conjunctivitis and other signs of inflammation, the affected rabbits show tumour-like myxomatous masses in the subepidermal tissues and in the lymph-nodes. These myxomata contain large stellate or polygonal cells which appear, according to Rivers,[48] to have multiplied under the stimulus of the virus. In the lymph-nodes they possibly arise from the reticulum of the gland. Mitoses are present in the lesions though not numerously. At the end of his paper describing the pathological changes in this disease, Rivers writes as follows:—

> "If, as some believe, the Rous sarcoma appears to be more closely related to true neoplasms than to diseases induced by highly contagious agents, then the myxoma, upon further study, may serve to bridge the gap between the Rous tumor and other virus maladies, and to indicate that, after all, no great difference exists between tumor-forming viruses and those causing vesicular or destructive lesions."

Another disease which may further help to bridge the gap is the infectious fibroma lately described by Shope.[49] This, like the infectious wart, naturally occurs in wild cottontails and is transmissible also to laboratory rabbits. In the cottontail one finds subcutaneous fibroma-like lesions which only regress after many months. On injecting such material —or filtrates from it—into the testes or subcutaneous tissues of tame rabbits, Shope found that similar fibromatous lesions developed. They were white, rubbery in consistence, and histologically showed masses of spindle-shaped or polygonal cells, often in whorls; mitoses were scarce. Dr. Shope kindly sent me some of this virus and I have studied histologically the early changes produced by it in a rabbit testis and can confirm his findings; the primary lesion is a proliferation of the connective tissue cells, though some polymorphs are usually to be found also. Later the picture strongly recalls a spindle-celled sarcoma. There is, however, no metastasis to distant organs, and the fibromata always ultimately regress. The condition was unexpectedly found by Shope to be related to infectious myxomatosis, some cross-immunity between the two diseases being present; the fibroma-like condition differs greatly from the other, however, in that infection of one rabbit from another has not yet been demonstrated. I found no evidence of cross-immunity between the fibroma virus and a true tumour in a rabbit; rabbits in which the epithelial tumour of Brown and Pearce had regressed were normally susceptible to Shope's fibroma virus.

The interest of this virus does not end here. For apparently a mutation or adaptation of the virus can occur when it is passed through domestic rabbits. As a result of this change it no longer produces cell proliferation and tumour-like swellings but causes fever, necrosis at the site of inoculation, œdema, hyperæmia, and acute outpouring of inflammatory cells. More than this, inoculated rabbits may develop on the shaved skin generalised pock-like lesions recalling those of generalised vaccinia in the rabbit. I have recently had under study three strains of the virus: (*a*) is but a little way removed from the original cottontail tumour and produces fibroma-like lesions often of considerable size; (*b*) causes no primary proliferation of connective tissue cells but only acute inflammation accompanied by generalised pocks; (*c*) is a mixed strain which gives rise to nodules of fibroma-like growth in the midst of inflammatory lesions but never to big tumours; it also frequently produces skin-pocks. So far as I can determine I am not dealing with a mixture of two distinct viruses. The inflammation-producing strain completely immunises against the tumour-causing strain and vice versa. Neutralisation tests with immune sera confirm this result. We have apparently to deal with a virus which in two phases of activity can produce what is very like a tumour—or what is more like an eruptive fever. The interest of such a virus to the present argument needs no emphasis.

The next example in our series is Fujinami's [50] myxosarcoma as it affects well-grown ducks. Filtrates of this tumour, which was originally of fowl origin, injected into the leg of an adult duck produce tumours which grow very rapidly and may reach almost the size of a tennis-ball before they begin to regress [51] as, in the end, they always do. They only show local malignancy and do not metastasise. Histologically the picture is that of a myxosarcoma. Clearly the state of affairs is not very different from that of one phase of Shope's rabbit fibroma. The tumour is propagable by means of filtrates, but only if tumours from young ducklings are used as the source of material. In these young ducklings the picture differs chiefly in that the death of the bird often occurs; possibly this results from mechanical causes, the tumours being large relatively to the size of the host. If filtrates of this same sarcoma of Fujinami's are injected into a fowl the events are at first like those in the duck; a local sarcomatous tumour develops. But instead of regressing after a week or two it continues to grow and the bird almost invariably dies. Metastases occur, chiefly in the lungs, liver, and heart. The tumour is propagable indefinitely by means of cell-free filtrates; it is in fact in most respects identical with the Rous No. 1 sarcoma.

We may next turn to the Rous sarcoma when in the state, already mentioned, in which it grows poorly and cannot be filtered.[7] We may point out that during these phases its behaviour is like that of a non-filtrable mammalian sarcoma. The fowl endothelioma of Begg (Mill Hill 2) [52] is still more apt to defy all efforts at filtration for long periods.

A next stage is seen in the slow-growing fowl fibrosarcoma Mill Hill 1, also described by Begg. For

about three years after it was first propagated it formed such hard growths that it was impossible to make an extract wherewith to test filtrability. After a few passages it began to grow more rapidly and was finally found to be filtrable.[6]

From such a tumour it is not a difficult step to a fowl-sarcoma which has not yet been filtered, nor from that to a non-filtrable mammalian sarcoma.

In the course of these lectures I have frequently used the term "true tumour," but I do so against my better judgment. I neither affirm nor deny that, for instance, Shope's rabbit fibroma is a true tumour, for the more I consider the two pathological series just described, the less I know what a true tumour is. One can, of course, draw an arbitrary line anywhere in the series I have described if one chooses to define a tumour according to one criterion only, for instance, non-transmissibility by filtrates, power of infiltrating growth, power of progressive independent growth, ability to metastasise, or formation of tumour by multiplication of a single cell type. But if one believes, as most pathologists do, that a tumour is best defined by considering a number of criteria, then one cannot, so far as I can see, draw a sharp line across either of these two series; nowhere can one reasonably say "Below this line are tumours, above it are infections."

Metabolism of Virus Lesions

The work of Warburg and his collaborators on the carbohydrate metabolism of tumours has shown that these differ from normal tissues in the relatively large part played by anaerobic glycolysis as compared with aerobic oxidation or respiration. The facts brought to light have been used as the basis of theories of carcinogenesis. Crabtree [53] has applied Warburg's technique to the study of pathological overgrowths caused by viruses. Tissues from fowl-pox and from human warts showed essentially the same carbohydrate metabolism as Warburg found in tumours; so did material from Rous sarcoma. On the other hand, lesions from the skin of rabbits with vaccinia and from the brain of a guinea-pig with rabies showed no great deviation from normal. The abnormal metabolism appears to be associated with cell proliferation as such and not to be specifically associated with "true" tumours.

In this first lecture I have attempted to maintain that the behaviour of a tumour, *once the malignant change has begun*, is what might be expected of a virus disease in which there was a certain balance between the infecting parasite and the host-cell, so that neither tended to destroy the other. If this were all, the parasitic theory of cancer would be much more popular than it is. But difficulties at once arise when we turn our attention to the inception of the malignant change in a cell; and these difficulties we have to face in the second lecture.

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(*Continued at foot of next column*)

PERINEO-ABDOMINAL EXCISION OF THE RECTUM IN ONE STAGE*

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CANCER of the rectum is one of the most hopeful of malignant tumours if treated by radical surgery, and one of the fascinations of the surgery of this region is the variety of operations which can be applied. This also constitutes a difficulty, for the operator has the responsibility of selecting the operation which he believes will be most suited to the particular case. In the light of our present knowledge it can be asserted that the operation of choice should be the most radical one that can be performed with reasonable safety to the patient; the patient's general condition, the extent of the growth, and its height above the anus, being the points which particularly need to be considered.

For many years there has been a controversy in this country regarding the merits of perineal excision of the rectum compared with the abdomino-perineal, and I think the present time is suitable for presenting certain facts which relate to this problem. There is a field of usefulness for each operation provided it is recognised that usually a combined abdomino-perineal or a perineo-abdominal excision (which latter, I venture to suggest, is the better method) is definitely more radical than a perineal excision. There are two possible exceptions to this rule.

(1) Those early cases in which there is a single small mobile carcinoma in the middle or lower thirds of the

* A post-graduate lecture delivered at St. Mark's Hospital on June 15th, 1934.

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rectum without glandular metastasis or evidence of related adenomata above the growth. In such cases a perineal excision is as radical and as effective in curing the patient as an abdomino-perineal excision.

(2) Those late cases in which pre-operatively it is possible digitally to demonstrate extrarectal spread in the form of nodules or indurated lymphatics outside the rectal wall. These are advanced cases with marked lymphatic spread, and if considered "operable" are certainly ineradicable by the perineal route, and probably are equally ineradicable by a combined excision.

The early cancers low down in the rectum are rare, and it is problematical whether a surgeon, however experienced, can accurately forecast the presence and extent of extrarectal spread after a carcinoma has passed beyond the clinically early stage. In any average series of operable cases it is likely that approximately half will have glandular metastasis (Dukes [1] reports 47 per cent., McVay [2] reports 47 per cent.), and the following arguments favour a combined operation.

ADVANTAGES OF COMBINED OPERATIONS

1. *Situation of the primary growth.*—It is agreed by most authorities that the rectosigmoid is the common site for a carcinoma in this region. In a recent survey of 100 cases, Rankin, Bargen, and Buie [3] found that 69 were at the rectosigmoid juncture. This is in close agreement with the figure of 67 per cent. reported in 1903 by Tuttle,[4] and constitutes in itself a sound reason for carrying out a combined operation in at least two-thirds of the cases.

2. *Removal of the zone of upward lymphatic spread.*—Excision of the rectum by the combined route enables a ligature to be placed round the inferior mesenteric pedicle at an average height of 10 inches above the anus, which is at least 3 to 4 inches higher than the usual level of ligation effected in the course of perineal excision. In those cases in which extrarectal extension of the carcinoma has taken place with infection of the lymphatic glands (C cases by Dukes's classification), the extra few inches of the superior hæmorrhoidal pedicle gained by a combined excision may in some cases be the determining factor in eliminating the disease.

In a previous paper [5] I have reported that in C cases treated by perineal excision only 19 per cent. survived free from recurrence at the end of three years; this figure is almost identical with that reported by Rankin,[6] who shows 20·7 per cent. of good results after excision of the rectum in patients with proved metastases. It is now possible to state the results of the St. Mark's Hospital cases at five years; out of 20 C cases of perineal excision (operation survivals), operated upon prior to June, 1929, 15 have died from recurrence, 2 died from other causes, and only 3 have survived free from recurrence for five years—i.e., 16·6 per cent. ($\frac{3}{18} \times 100$). This result in a small series of cases expresses the failure by perineal excision to remove a sufficient length of the path of upward lymphatic spread, and in this respect there should be an expectation of achieving better results by a combined excision. At the present time, however, there is to the best of my belief no actual proof of the outstanding superiority of abdomino-perineal excision in C cases, and the following records suggest that in this late group a large proportion of cures cannot be expected. They summarise the results in 29 cases after survival from different types of combined abdomino-perineal excision.

(i) In 3 cases one-stage abdomino-perineal excisions were done more than five years ago. Of these 2 were A cases and have survived for nine and seven years respectively; 1 was a C case and died of recurrence two and a half years later.

(ii) In 4 cases two-stage abdomino-perineal excisions were done by Coffey's technique in 1929. Of these 2 were B cases and are now (June, 1934) alive and well; 2 were C cases and have died of recurrence.

(iii) In 1 case a two-stage abdomino-perineal excision using Dudley Smith's clamp was done in 1930. This was a C case and the patient died of recurrence 16 months later.

(iv) In 21 cases perineo-abdominal excisions were done between 1928 and 1933. There were 4 A cases and 6 B cases, who are all alive and well for varying times up to five and a half years. There were 11 C cases of whom 4 have died within three years after operation (2 recurred in liver, 1 had peritoneal secondaries, 1 secondary deposits in the brain). The remaining 7 are alive and well, the longest survival being nearly four and a half years.

It will be seen that in 29 cases the 8 bad results have been confined to proved C cases. The question of the eradication of the disease in such cases by a combined excision is one which we are actively investigating in St. Mark's Hospital. I believe there are grounds for saying that in the C group there will certainly be a number whose disease can be eradicated by a combined excision when a perineal excision would be inadequate.

3. *The length of bowel removed.*—By perineal excision the average length of bowel excised is not more than 9 inches; in many cases, owing to the difficulty in mobilising the rectum, the length is not more than 6 or 7 inches. By a combined operation such as the one now to be described an average length of bowel removed (anus to iliac colon) is 18 inches. The importance of this is in regard to the frequent incidence of adenomata above the main tumour, and to the not so rare occurrence of double malignant growths. During 1933 I had the unusual experience of finding double carcinomata in 3 out of 12 long specimens removed by perineo-abdominal excision. These are shown in Fig. 1; in each case the second tumour was not diagnosed before operation; it was found at a considerable distance, varying from 5 to 12 inches, above the rectal growth, and would certainly have not been removed by perineal excision. Examples such as these provide a good explanation of certain cases of intrapelvic "recurrence" after perineal excision.

4. *Difficulty of establishing a colostomy in continuity ("loop colostomy").*—A colostomy in continuity, which is a necessary preliminary to perineal excision, is occasionally a difficult or unsatisfactory procedure; in stout subjects or in those with a short pelvic mesocolon it may be impossible to bring a loop of pelvic or iliac colon to the surface without tension. There is subsequently a persistent tendency to colostomy retraction. The alternative of doing a transverse colostomy is not at all desirable in view of the long blind length of colon which remains after perineal excision. There is no doubt that in stout subjects the terminal colostomy which is left after a combined excision is both easier to establish and is more satisfactory subsequently; it cannot be affected, as is the loop colostomy, by "spur retraction."

5. *Other dangers or drawbacks of perineal excision.*—In subjects with a fat-laden pelvic colon it is often a difficult matter to effect a sound closure of the bowel in the course of a perineal excision; the formation of a mucous fistula into the perineal wound is a common and tiresome complication, which may be due, as mentioned above, to operative difficulties, or subsequently to the cutting out of the sutures closing the bowel; to poor healing capacity; or to the presence of fæcal masses in the pelvic colon distal

FIG. 1*a*

FIG. 1*b*

FIG. 1*c*

FIG. 1.—Photographs of three specimens of the rectum and pelvic colon removed by one-stage perineo-abdominal excision. In each case a second carcinoma (shown by the upper arrow) is present several inches above the rectal carcinoma.

(*a*) Specimen 18 inches in length from a male aged 62. An ulcerating growth, 2½ inches in diameter, extended almost completely round the middle third of the rectum; 9 inches above this growth there was a small indurated, pedunculated, and partly ulcerated tumour. Both tumours proved to be adenocarcinoma on section. Metastases present in the glands—C case.

(*b*) Specimen 18 inches in length from a male aged 77. A semi-ulcerated protuberant tumour almost completely encircled the upper part of the rectum; on section it was found to be an adenocarcinoma which had not extended into the extrarectal tissues. A pedunculated polyp 5 inches higher proved on section to be an adenoma which had undergone malignant change, with infiltration of the stroma. Glands free from metastases—A case.

(*c*) Specimen 21 inches in length from a male aged 66. Two ulcerating growths were present; one appeared as a flat ulcer 2 inches in diameter in the lower third of the rectum; the other, 1½ inches in diameter, completely surrounded the bowel in the rectosigmoid region. Both proved to be adenocarcinoma with involvement of the glands—C case.

to the colostomy. The presence of clear mucus on the perineal dressings is certain evidence of the development of a mucous fistula, which may in course of time close spontaneously; but it often persists, and is the cause of much continued annoyance from the discharge and recurrent perineal abscesses. A slight soiling of the wound no doubt takes place sometimes in the course of a perineal excision at the stage when the divided bowel is being inturned by suture. Occasionally serious sepsis occurs, and is, I believe, not uncommonly due to the presence of diverticulosis of the pelvic colon; diverticula contain highly infective material, and if they are pricked by a needle the consequences may be serious. I have lost one case of perineal excision from acute anaerobic wound infection with gas formation, which was undoubtedly due to this cause, and I now regard perineal excision as an operation of questionable merit in the short, thick-set subject, who has certainly a fat-laden pelvic colon, and possibly diverticulosis. Even if no gross sepsis occurs, the healing of perineal excision wounds often lags behind that of combined excision cases, and this is no doubt due to the presence of the sewn-over bowel stump, with a mild infection of the pelvic cellular tissues round it.

These various points form a very considerable argument in favour of a combined abdomino-perineal excision, provided a technique can be employed which will enable the operation to be done without a rigid exclusion, on the grounds of age or general condition, of that common type of rectal cancer case, particularly in males, who is classed as a "poor risk."

THE OPERATION RECOMMENDED

The merits of abdomino-perineal excision of the rectum by Miles's technique have been generally accepted, but the considerable number of two-stage modifications which have been described indicate the desire and the attempts of different surgeons to minimise the risks of the original operation. The chief risks of abdomino-perineal excision are sepsis and shock.

Sepsis may occur at the time of the intra-abdominal division of the pelvic colon, or during the time that the devascularised bowel is lying in the pelvis (pending the perineal removal), with a wide area of newly exposed pelvic cellular tissue round it.

Shock, most surgeons will agree, supervenes in the latter stages of the operation, particularly when the patient is turned over into the left or right lateral position, and during the final perineal excision.

The one-stage perineo-abdominal excision which will now be described is, I submit, an easier operation

to perform provided the operator has the experience which enables him to do a neat perineal dissection; it overcomes the serious difficulties of a narrow male pelvis, especially in those cases with a large tumour at the rectosigmoid junction; the dangers of sepsis and shock are largely eliminated—the former by avoiding intraperitoneal section of the colon, and shock by doing the perineal part of the operation first, so that no turning of the patient is required after completion of the abdominal operation. It fulfils all the requirements of a radical operation in regard to high section of the vascular and lymphatic pedicle; in regard to the length of bowel removed, I believe it is slightly more radical than Miles's operation, for the entire length of the rectum and pelvic colon up to the left iliac colostomy is removed.

In many of the classical operations of a radical nature, such as gastrectomy, nephrectomy, ovariotomy, it is an accepted principle to mobilise the part to be removed, and then to use it as a steadying agent by which a little traction may be applied, if required, until the vascular pedicle has been secured by transfixion and ligation, whether by use of an aneurysm needle or other form of ligature carrier. This principle is employed in perineo-abdominal excision and enables the operator to ligate the inferior mesenteric artery between the first and second sigmoid branches, which will free the entire pelvic colon for removal.

Preparation of the patient.—It is advisable that the patient should rest in bed for 7 to 10 days before operation, and much has to be done in this time.

(1) His cardiac condition and blood pressure will be estimated, and if necessary small doses of digitalin, such as Nativelle gr. 1/600 twice daily, may be indicated. (2) The urine excretion and blood-urea will be measured, and forced intake of fluids by the mouth will be encouraged. (3) Glucose in the form of barley sugar or glucose with lemonade or barley water will be given daily. (4) Smoking will be restricted and deep breathing encouraged. Dental sepsis will be attended to. (5) The diet will be of a non-residue nature, and the bowels will be cleared by aperients. Mag. sulph. may be given on two or three days in the amount of 1 drachm in water hourly for three or four doses; this will render the motions fluid and should eliminate any fæcal impaction above the growth. A simple enema is given on the night before operation, and a rectal tube is passed on the morning of operation. It is important that no free fluid should be present in the rectum at the time of operation. (6) In order to promote and maintain bowel tone, 0·5 c.cm. of Pitressin is given hypodermically one hour before operation, and is continued at four-hourly intervals for the first two or three days after operation.

Anæsthesia.—Although a few of these operations have been done under spinal anæsthesia, it is my firm conviction that my patients have done better under general anæsthesia, with novocain infiltration of the rectus muscles, than they have under spinal anæsthesia, or a combination of spinal and general anæsthesia. The operation as I do it takes two hours to complete, and a number of very frail patients have come safely through the operation under straightforward general anæsthesia (gas and ether, open ether, and in the latter stages, gas and oxygen), when I am sure that spinal anæsthesia would have been dangerous or even fatal. There have been two deaths on the table in stout subjects who had received a spinal injection; supplementary general anæsthesia was required while they were in the Trendelenburg position, and death took place imperceptibly, probably from a combination of lowered blood pressure with respiratory and cardiac failure. I feel sure that with general anæsthesia alone no difficulty would have been experienced. Quite a number of these cases have had a pulse-rate of 100 or more at the beginning of the operation, and at the conclusion two hours later, after general anæsthesia alone, the rate has slowed to 84–96.

Operative technique.—The operation of perineo-abdominal excision in one stage is carried out in the following distinct steps:—

1. For tumours in the upper third of the rectum, and for all tumours in the advanced or borderline category, an abdominal exploration is done through a right paramedian subumbilical incision. The liver, great omentum, and pelvis are examined in turn, and the operability of the growth confirmed before proceeding. The wound is closed temporarily by through-and-through silkworm gut sutures with an anchored gauze dressing.

2. The patient is turned into the left lateral position, the anus is firmly closed by two purse-string sutures of stout silk, and the perineal excision is proceeded with in the usual manner, after disarticulation of the coccyx. Before opening the peritoneum the anus and rectum are enveloped in wet flavine gauze, and a sterile glove is tied firmly over. After opening the peritoneum straight scissors are used to incise the peritoneum upwards on each side of the colon (about ½ in. distant), *for as far as possible.* (Fig. 2.) The rectum is mobilised laterally and posteriorly without encroaching on the superior hæmorrhoidal vessels, and is then pushed up into the pelvis. The posterior third of the perineal wound is sutured, a clean flavine pack is tucked into the remainder of the wound, and a sterile towel covers it. The patient is turned on to his back.

3. Trendelenburg position. The abdominal wound is reopened and small intestines packed out of the pelvis. The glove covering the rectum will now be seen and, as a rule, even in a narrow male pelvis, the rectum will be readily delivered upwards. The lateral incisions are continued upwards and with little difficulty the rectum and pelvic colon are stripped up till they are delivered freely out of the abdominal wound. The inferior mesenteric pedicle is now clearly defined by traction on the bowel, and the optimum point for application of a double silk ligature is made

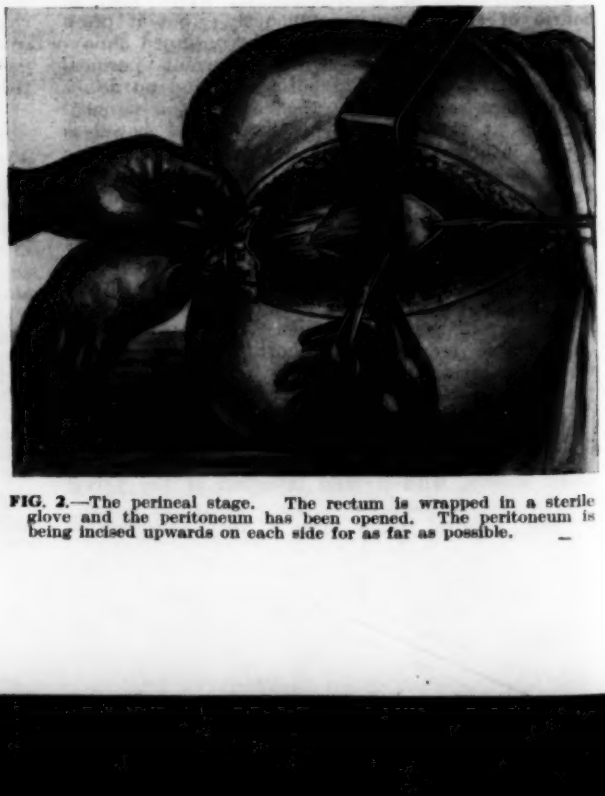

FIG. 2.—The perineal stage. The rectum is wrapped in a sterile glove and the peritoneum has been opened. The peritoneum is being incised upwards on each side for as far as possible.

out. The pedicle is divided between the ligatures, and for additional security a second ligature is tied round the upper cut end of the vessels.

4. A left iliac muscle-splitting incision 4 inches in length is made, with some cutting across the fibres of the internal oblique. The iliac colon is brought out and the space lateral to the iliac colon is closed by a running atraumatic catgut suture. The rectum and pelvic colon are passed through this incision up to the stitch closing the lateral space. (Fig. 3.)

5. The pelvis is now empty and closure of the pelvic floor is a very easy matter, using a double No. 1 catgut stitch on a curved needle; no mobilisation of the flaps is required as a rule, and a running suture is made extending back from the posterior aspect of the bladder or uterus, and eventually burying the ligature round the inferior mesenteric vessels. (Fig. 4.) The appendix is removed if it looks at all unhealthy, and the great omentum is pulled down. The paramedian incision is closed without drainage, and the left oblique incision is closed in layers round the emerging colon.

6. The pelvic mesocolon is now ligated about 1½ inches external to the skin, gauze dressings are applied, and the bowel is divided at the same level by a cautery in between clamps. The specimen of the rectum and pelvic colon is now removed, the division being in this way carried out as an extra-

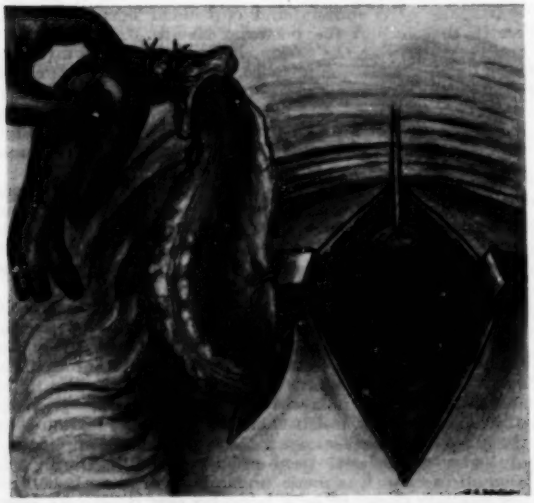

FIG. 3.—After ligation of the inferior mesenteric pedicle the mobilised rectum and pelvic colon are brought out of the abdomen through a left iliac incision. (Semidiagrammatic with omission of details of towels and packs.)

abdominal manœuvre. The crushed edges of the emerging colon are separated, and a No. 17 rubber catheter passed down and sutured in. Five ounces of warmed olive oil may with advantage be run through the tube with the object of being retained and lubricating the colonic mucous membrane; easier passage of flatus may in this way be promoted.

7. The median abdominal incision is sealed with gauze and Elastoplast. Finally the legs are held up by an assistant on each side, and the toilet of the perineal wound is completed; the wound is swabbed dry and hæmostasis verified; a sterilised yellow rubber bag (made for anæsthetic purposes by the Dunlop Rubber Company) is inserted and packed with gauze. The anterior third of the perineal wound is sutured and dressings are applied by lifting the patient and not by rolling him.

The only modification in the foregoing description which needs mentioning is that in 13 cases I have dispensed with the preliminary laparotomy and have

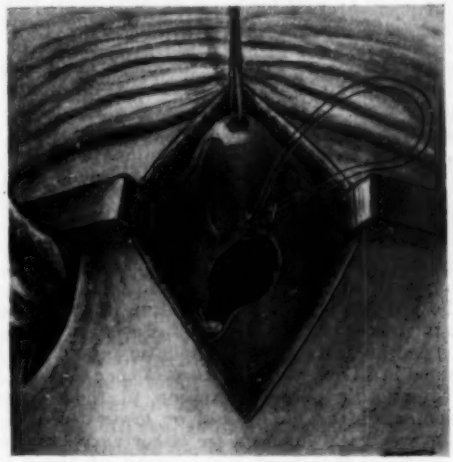

FIG. 4.—Closure of the pelvic peritoneum.

done the operation as a "blind" one-stage perineo-abdominal excision. The cases selected for this have been those in which a clearly mobile and certainly operable carcinoma has been present, with the entire length of the tumour within reach of the finger. Although this method may be criticised on the score of possible liver secondaries being present, I do not believe it to be a valid objection. The passing of a hand over the surface of a liver and finding it smooth does not by any means exclude the presence of central secondary deposits, and if the operator has experience in assessing operability, I believe the blind operation is valuable—it saves both time and a turn. I have not yet found my pre-operative estimate belied by local fixity, or peritoneal or liver secondaries. I should not on any account advise this blind operation for a high constricting or deeply ulcerated carcinoma; in these cases abdominal exploration is imperative.

In view of the risk of sepsis in the abdominal wall I have abandoned perineo-abdominal excision as a second stage after a preliminary colostomy operation. In most cases, by suitable preparation, the bowel can be rendered empty and fit for a one-stage operation. If in the case of a constricting carcinoma in the recto-sigmoid region a preliminary drainage operation seems imperative, a cæcostomy would appear to be preferable. I have done this in a recent case, followed by perineo-abdominal excision, with a very satisfactory result.

Subsequent treatment.—The foot of the bed is raised on medium blocks for 24 to 48 hours. An intravenous injection of saline with 5 per cent. glucose (20–30 oz.) is given after operation, and may with advantage be repeated daily for the next two or three days. The gauze packing is removed from the perineal bag on the second post-operative day, and the bag itself is taken out on the next day. The perineal wound is then irrigated and dressed with eusol morning and evening, and usually heals very quickly. The sutures are removed from the perineal wound on the sixth or seventh day. There are no other details of any importance to record; the post-operative course has usually been singularly smooth and free from anxiety.

IMMEDIATE RESULTS

Since January, 1932, I have done this operation in one stage on 25 occasions (12 with preliminary laparotomy and 13 without). Three patients have been 70 or over and have recovered; the oldest was a man aged 77 who made an uninterrupted recovery after the operation. Two other notable recoveries have been the case of a stout woman of 40 who weighed 13 st.; and a minute little woman (70 years) who was only 4 ft. 8 in. high, and weighed 5 st. 11 lb. In 25 cases there have been 5 operative deaths; 2 deaths on the table which were due, I think, to an exceptional combination of circumstances; 1 death on the fourth day (male aged 69) was clearly due to cardiac failure with auricular fibrillation; and 2 occurred on the seventh day from a combination of small intestinal ileus and bronchitis; this happened before I had begun the prophylactic injections of pitressin.

The justification for the operation in these cases is that microscopical proof of metastases in the glands along the line of upward lymphatic spread has been obtained in 14 out of the 25 cases (56 per cent.). I am now restricting perineal excision to those cases of carcinoma of the anal canal or lower third of the rectum when the tumours are either very early, or so late that by reason of involvement of the vagina, prostate, or ischiorectal fossa, the extra risks of a combined excision do not appear to be justified.

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CYST FORMATION IN OVARIAN GRAFTS

WITH REPORT OF A CASE

By James S. Hall, M.B. Lond., F.R.C.S. Edin.

HON. SURGEON TO THE VICTORIA HOSPITAL, DEAL

The recorded cases of cyst development in extraperitoneal ovarian grafts are curiously few in number. Lack in 1924 was only able to find 2 cases specifically mentioned in the literature, one by Graves, who performed three operations for subsequent changes in a bilateral graft, the other by Blair Bell, who had 2 cases in a series of 150 grafts, the second of which, I believe, is still unpublished. A further case was reported by Lockyer after the above paper, making a total of 5 in all.

I was able, after a careful search, to augment this list by 2 cases quoted in some detail by Mayer. The first is probably the earliest recorded (Columbino, 1914), the second by Unterberger in 1919. This case is especially interesting because a cure followed simple puncture; most of the other cysts have given much more trouble. Since 1924 there appear to be three more case records. Here is the chronological table to date:

Columbino ..	1914	Lack	1923
Graves ..	1915	Mayer	1927
Unterberger ..	1919	Heynemann ..	1930
Lockyer ..	1920	King	1932
Blair Bell * ..	1920		

* Two cases.

The following case of my own in 1933, to the best of my knowledge, completes the list.

NOTES OF CASE

A married woman of 23 with one child aged 2 years, was admitted to the Victoria Hospital, Deal, in 1929. She complained of abdominal pain chiefly localised in the left iliac fossa of several months' duration with exacerbation of the pain at the periods. Examination showed enlarged and tender tubes which at the subsequent operation were found inflamed and adherent. The left ovary was involved in the inflamed mass and contained several cysts. Both tubes and this ovary were removed, the right ovary, which appeared normal, being left. The appendix had been removed several years before. Convalescence was uneventful, the patient leaving hospital healed and free from pain.

She consulted me again in November, 1931, with dysmenorrhœa and fairly severe abdominal pain, this time chiefly confined to the right iliac fossa and of the same type as her left-sided pain of two years before. In spite of various treatment she became worse and I readmitted her to hospital in July, 1932, for further operative treatment. As this almost certainly involved removal of the second ovary it was done with great reluctance, in view of the fact that the patient was a thin and extremely nervous type, quite the last case one would choose for an artificial menopause.

At operation the remaining ovary was found enlarged and cystic. The uterus showed nothing abnormal and was left alone, the ovary being cleanly removed. A section of the healthiest end was taken, about the size and shape of a shilling, and embedded between the left rectus muscle and the posterior sheath. An uneventful recovery followed, the patient leaving hospital a fortnight later. Her subsequent history is as follows: Periods (previously of 5/28 type) recommenced three months after operation, and were of a 5-14/28 type. The loss was not excessive even in a prolonged period, and no pain was felt in the region of the graft although some tenderness and enlargement occurred at these times.

In December, 1932, flooding commenced and periods became more regular and of a 10/28 type with one curious exception. A hot-water bottle applied to the now definite swelling in the left rectus muscle always produced a "period" the next day. Pressure or injury to the abdominal wall had no such effect.

In October, 1933, she again sought admission to hospital for relief of excessive flooding and a very painful and tender swelling about the size of a hen's egg in the region of the graft. She volunteered the information about the curious effect of the hot-water bottle applications, and stated that the pain was exactly similar to her previous ovarian pain but much more superficial. Pressure on the lump made her feel sick. An experimental application of the hot-water bottle produced a "period." During this a small incision was made under Evipan anæsthesia and the swelling found to be a bilocular cyst filled with clear straw-coloured fluid, the two parts being about 1 in. and ½ in. respectively in diameter. Small pieces of the cyst wall were removed for microscopy. Subsequent pathological report confirmed these to be normal ovarian tissue.

The patient is now free from pain again and has had a normal but scanty period (December, 1933) without pain in the uterus or site of graft. She is still thin and nervous, but otherwise in good health.

PREVIOUS CASES

The previous cases may be briefly summarised:—

Columbino in 1914 was forced to remove an extraperitoneal graft because local disturbances occurred. Corpora lutea were present and three-quarters of the whole graft was cystic.

Graves removed cystic ovarian tissue in 1914 from fat on the left side of an abdominal incision. A bilateral graft had been done six months before. A month later he removed similar tissue from the right side and eighteen months later removed still more cystic material from the left side.

Unterberger records a case in 1919 in which he treated

a case by simple puncture after which the cyst disappeared and regular menstruation continued.

Lockyer mentions a case which developed a tense cystic swelling six months after operation in 1920. This proved to be a blood cyst. It was opened and scraped. Five months later another small cyst developed, but as it caused no inconvenience it was left alone. He has since carefully removed the cortex of the ovary before cutting grafts.

Blair Bell in a personal communication to Lack quotes two cases of cyst removal on account of metrorrhagia which ceased after their removal. The cysts were probably follicular and not lutein in origin.

Lack gives details of a case of excision of cysts five months after operation. There were two cystic cavities in a dense mass of fibrous tissue, one with a yellow lining. Pathological report: "Follicular cysts; one showing changes suggesting a modified lutein reaction."

Mayer: Case of engrafting in November, 1926. Periods commenced in January, 1927. A painful swelling developed in March, 1927, due to a cyst. It was punctured with good results till May, when it refilled. A second puncture proved unsuccessful, so in July the cystic graft was removed with relief of the abdominal pain but onset of climacteric.

Heynemann is quoted by Mayer. He states that he has been compelled to remove grafts on account of painful swelling. On removal, follicular and blood cysts were found. Details of cases are not given.

King: This case, which occurred in Australia in 1932, includes a detailed pathological report of several blood cysts occurring in a case where, I gather, the whole right ovary was transplanted, with its corpus luteum. Menstruation recurred normally, but a year after operation periodic pain and swelling of the graft necessitated its removal. Examination showed two large cysts and several smaller ones filled with chocolate-coloured material and altered blood. They are described as atretic follicles with one cyst containing degenerated luteal tissue.

DISCUSSION

In reviewing what has been written on this subject one is struck by the waning enthusiasm of the experts for homogeneous ovarian transplantation. The reports previous to 1917 are nearly wholly favourable, and praise the immediate and remote effects of autotransplantation (vide Lydston, Newton, Norton, and Phillips). Even Benthin is favourably impressed with the results, although most German authors, except Unterberger, seem to have had a good deal of trouble with their cases. Siegert in 1929, for instance, analyses nine cases as follows: in 5 no period occurred between six months and a year after operation; in 2 irregular losses occurred for a short time; and in 2 regular periods occurred after some months. In one case only was the result really satisfactory. In this patient the periods recommenced after five months.

After 1917 the American and German records become more despondent. Martin, who gives excerpts from most of the previous writers, and Graves comment on the failure of grafting in cases of total ablation of the uterus and appendages. The latter author even gives the opinion that retention of ovarian tissue after hysterectomy may be productive of serious harm to the patient. It is certainly of interest that the enthusiasts, mostly American, published their results within a year of implanting the grafts. Sippel, whose publications are too numerous to quote, denies the efficacy of ovarian grafts in preventing ablation symptoms. He finds that intraperitoneal grafts frequently cause metrorrhagia and are often productive of abscesses and cysts. This habit of intraperitoneal grafts to become cystic is confirmed by most authors and makes it seem still more curious that so few extraperitoneal cysts are recorded.

The consensus of opinion at the moment seems to be that grafts should not be implanted to prevent ablation changes, which rather limits their field of utility, but that they may occasionally benefit a case where the uterus has not been removed. There is quite a chorus of approval for grafting in cases of hypogenitalism and eugenic sterilisation, particularly from Lydston (quoted by Martin), who records successful heterogeneous grafts taken from the dead body *any time before decomposition set in!* (The italics and exclamation mark are mine.)

Recent work on autogenous grafts suggests that the pendulum is again swinging towards a favourable view. The latest European report of Cheval and Mayer is almost wholly favourable even in cases of total and subtotal hysterectomy. They state that the only portion of the graft which persists and develops is the superficial layer containing the germinative epithelium and primordial follicles, the centre merely necroses; thick grafts are therefore useless and peeling of the surface is inadvisable. The superficial layers should be preserved and handled carefully. Two or three grafts are placed either in the superficial part of the right rectus muscle under the aponeurosis or in the subcutaneous cellular tissue (preferably in the submammary furrow). Uterine grafts are also advocated. These are cut from the removed uterus after swabbing it with 5 per cent. iodine and dividing it into anterior and posterior halves. They should include the mucosa, submucosa, and a small portion of the muscle.

An analysis of the results of 32 cases gives the satisfactory report of "endocrine troubles were absent and menstruation conserved" in 70 per cent. It is further stated that for three months after the operation patients still suffer from all the troubles of the menopause; these attenuate and disappear when menstruation is re-established, which rarely occurs before the fourth and usually at the eighth month.

In the recorded cases of cystic changes in grafts, much discussion has occurred about the nature of the cysts. With two exceptions they all seem to have been simple follicular cysts containing straw-coloured fluid; the others contained blood and sometimes showed lutein changes. Without entering pathological territory I should like to suggest a possible common origin for all these cysts. In a normal ovary the Graafian follicle ruptures into the peritoneal cavity and discharges an ovum and a variable quantity of blood, sometimes sufficient to suggest a diagnosis of ruptured ectopic gestation. This is usually, except in extreme cases, easily absorbed by the peritoneum. The extraperitoneal graft has no convenient peritoneal cavity for this purpose, and the ova and products of the corpora lutea are presumably scattered about in the fascia and absorbed. Should absorption fail to occur a hæmatoma with a partial epithelial lining would be left. Subsequent degeneration of the granulosa cells and serum exudation would produce small cysts of a similar character to those described.

Some authorities advocate stripping the ovarian cortex before taking grafts as a method of preventing cyst formation. This would, of course, remove the germinal epithelium (Cameron), but it is difficult to see how it would prevent cystic degeneration unless these described are really multilocular cysts of cortical origin. If so, it may strengthen the theory of their development from the so-called "egg tubes" of Pflüger on which a certain discredit has been cast by former writers. If, however, Cheval and Mayer are to be believed, such decorticated grafts would

inevitably die and therefore cyst development would be aborted.

Should cysts occur in a graft removal appears to be the best treatment; in one case only has a cure followed simple puncture. All authorities agree that extraperitoneal implantation is simple and free from danger in selected cases, also that no recorded changes of a malignant character have yet occurred.

I should, in conclusion, like to thank Mr. T. J. Shields, the librarian to the British Medical Association, for his very considerable assistance with the references.

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GASTRIC DIGESTION OF RAW AND BOILED MILK IN INFANTS

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AND
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THERE is still much discussion on the relative digestibility of boiled and unboiled cow's milk. Graham and Morris [1] found that in infants the protein, fat, and minerals of boiled and unboiled milk were equally well absorbed. M. Andross [2] concluded from in-vitro experiments that pasteurisation, and to a greater extent boiling, renders the protein of milk less readily digested by pepsin and trypsin. Stirling and Blackwood,[3] in their comprehensive monograph, reviewed the results of previous experiments on the digestion of boiled and unboiled milk, and state that these results were very conflicting. At any rate, the results of in-vitro experiments must be applied with caution to the course of digestion in the living subject where the conditions are clearly different, for in these the amount and composition of the gastric secretion may be altered in response to different types of food.

From the practical point of view, therefore, it seemed advisable to study on the infant the effect of boiling on the gastric digestion of milk. For this purpose the gastric contents were removed before and at half-hourly intervals after test-feeds of raw and boiled milk. The following were used as indices of the course of digestion.

(1) The amount of free hydrochloric acid and total chlorine, and the degree of total acidity. This was done since the reaction of the gastric juice is of considerable importance in the digestion of proteins and the utilisation of minerals.

(2) Peptic activity, to determine whether any change in the physico-chemical composition of the milk alters the secretory activity of the zymogen glands.

(3) Soluble non-protein nitrogen as an index of the extent to which proteins are disintegrated.

(4) Soluble calcium as an indication of the capacity of the gastric secretion to convert minerals into a soluble and therefore a readily assimilable form.

The last two were specially chosen because of the frequently reiterated claims [3 4] that the main drawback of boiled milk is that changes occur in the nature of its calcium and nitrogenous constituents, rendering them less susceptible to the action of gastric juice.

Fractional test-meals after raw and boiled milk were carried out on 17 infants whose ages ranged from 3 to 23 months, and who had recovered from the various diseases for which they had been admitted to hospital and who appeared healthy at the time when the tests were performed. The test-feeds consisted of boiled or raw milk in amounts varying with the age of the subject; the gastric contents were examined before and at half-hourly intervals for two hours after the feed.

The amount of curd was noted in each specimen which was then filtered through glass wool. The free hydrochloric acid, total acidity, and total chlorine of the filtrate were estimated by the usual methods, and the pH of each specimen determined by means of the B.D.H. capillator. A measure of the peptic activity was obtained by the Mett's tube method; the amount of egg-white digested after incubation for 24 hours was measured in millimetres, and the figure obtained taken as an index of peptic activity. The proteins were removed by the addition of 9 c.cm. of 15 per cent. trichloracetic acid to 1 c.cm. of filtered gastric contents. The precipitate was filtered off and the filtrate used for determining the non-protein nitrogen by the micro-Kjeldahl method. The soluble calcium was estimated by a modification of Kramer and Tisdall's method. The results are given in detail in the Tables.

ACIDITY

The pH varied between 6·8 and 4·6 in the absence of free acid, but was as low as 2·1 when free hydrochloric acid was present. The difference (0·28) between the average maximum for raw and boiled milk (3·99 and 3·71 respectively) was not significant. Wills and Paterson [5] state that the average pH for normal infants on cow's milk is 3·5, but they do not state whether the milk was boiled or not.

No free hydrochloric acid was found in either test in 8 cases (47 per cent.), while in 4 the maximum was higher with raw milk, in 3 with boiled milk, and in 2 it was the same in both. The average maximum figure was higher with raw milk, being 5·9 c.cm. N/10 NaOH for raw and 4·6 c.cm. N/10 NaOH for boiled, but the difference (1·3) was too small to be significant. There was very little difference in the maximal total chlorine of the gastric contents with raw and boiled milk. Actually there was only a difference of 0·5 milli-equivalents per litre between the average maxima.

The percentage maximum total acidity for raw milk varied from 25·0 to 66·7 c.cm. N/10 NaOH with a standard deviation of 4·3, and for boiled milk from 37·8 to 80 c.cm. N/10 NaOH, with a standard deviation of 3·8. In 10 cases the maximum was higher with boiled and in 7 with raw milk. The average maxima were 50·4 for raw and 53·4 for boiled milk; the difference, 3·0, however, was not found to be statistically significant.

It is obvious that there is no significant difference in the behaviour of either free hydrochloric acid or total acidity of the gastric juice with raw and boiled milks.

TABLE I

SHOWING THE MAXIMAL FINDINGS OBSERVED IN FRACTIONAL TEST-MEALS AFTER FEEDS OF RAW AND BOILED MILK

Case.	Sex.	Age in mos.	Free HCl.		T. acidity.		T. chlorine.		Peptic acidity.		pH.		Curd.	
			R.	B.	R.	B.	R.	B.	R.	B.	R.	B.	R.	B.
1	M.	3	16·7	11·10	25·0	45·0	64·6	56·6	28·9	44·1	4·0	4·2	+ +	+
2	M.	4	Nil.	11·12	27·8	43·7	96·1	70·7	8·1	22·5	4·5	2·4	+ + +	+ + + +
3	F.	7	,,	9·2	66·7	61·2	65·9	95·0	32·4	36·1	6·8	3·5	+ +	+ + +
4	M.	8	,,	Nil.	36·1	55·6	54·5	59·9	62·5	19·6	5·2	4·9	+ +	+ + +
5	M.	8	5·0	,,	47·0	50·0	79·8	70·9	8·1	6·4	3·4	3·8	+ +	+
6	M.	9	Nil.	,,	61·2	46·7	77·9	67·0	6·4	22·5	4·4	3·5	+ + +	+ +
7	M.	9	,,	,,	66·7	44·5	62·2	57·6	78·4	44·1	4·6	3·9	+ +	+
8	M.	12	10·0	10·0	63·3	80·0	88·9	87·4	25·6	78·4	3·4	3·0	+ + +	+
9	M.	14	22·24	11·12	66·7	51·1	75·1	74·5	22·5	14·4	2·3	2·3	+ +	+ + +
10	F.	16	Nil.	Nil.	55·0	65·0	64·6	65·6	57·6	22·5	4·0	3·6	+	+ +
11	M.	18	,,	,,	38·9	44·5	57·6	64·3	8·1	6·4	4·6	4·4	+ +	+ +
12	M.	18	4·45	5·56	46·7	40·0	70·2	69·1	32·4	3·6	3·2	3·4	− − +	− +
13	M.	18	20·0	Nil.	57·8	55·6	74·5	72·9	16·9	6·4	2·3	4·2	+	+ + +
14	M.	20	20·0	20·0	64·5	61·2	65·3	72·4	48·4	25·6	2·1	2·2	+	+ +
15	M.	23	Nil.	Nil.	50·0	55·6	75·5	86·7	32·4	16·9	4·4	4·4	+	− +
16	F.	23	,,	,,	33·4	37·8	55·1	58·9	36·1	25·6	5·7	5·2	+ + +	+ + + +
17	F.	23	,,	,,	50·0	70·0	81·0	80·1	25·6	16·9	3·0	4·2	+ + + +	+ + +
Mean ..		..	5·9	4·6	50·40	53·38	69·50	71·74	31·2	24·2	3·99	3·71	—	—

R. = raw milk; B. = boiled milk; T. = total.

RATE OF EMPTYING

The amount of curd varied considerably, but in 9 cases it was more abundant with boiled milk and in 7 with raw milk. In 1 it was about equal in amount with both types of milk. In 13 tests with raw and 14 with boiled milk there was obvious curd at the end of two hours, while in 4 with raw and 3 with boiled milk the two-hourly specimens were free of curd. In the majority of cases, therefore, the stomach was over two hours in emptying with both types of milk, which confirms the findings of Wills and Paterson,[5] who state that the stomach empties in two and a half hours in artificially fed infants.

PEPTIC ACTIVITY

The maximum peptic activity was higher with raw milk in 13 cases and with boiled milk in 4 cases, but there was a wide variation between the values in each ranging from 6·4 to 78·4 for raw milk with a standard deviation of 20·6, and from 3·6 to 78·4 for boiled milk with a standard deviation of 18·3. The average maximum for raw milk was 32·6 and for boiled milk 24·2. In view of the wide dispersion the difference between the averages cannot be considered significant.

SOLUBLE CALCIUM

The soluble calcium was estimated in 13 cases. It was low in the fasting juice and generally rose to a maximum within the first hour. In some cases there was a fall before the end of the second hour, while in others the value still remained high. With raw milk 4 showed the fall at two hours, while with boiled milk this was observed in 4 cases. In all, excluding the fasting specimens, 47 pairs of samples with raw and boiled milk were examined, and of these 30 showed a higher value with boiled and 17 with raw milk. The average of the maximal figures for raw milk was 52·4, and for boiled 62·0, which suggests that the calcium is better held in solution when boiled milk is used. But the maximal figures for raw milk ranged from 33·3 to 80·3 with a standard deviation of 12·5, and from 27·3 to 91·4 with a standard deviation of 18·1 for boiled milk; hence little importance can be attached to this difference in the averages.

TABLE II

SHOWING CHANGE IN SOLUBLE CALCIUM IN FILTERED GASTRIC CONTENTS AT HALF-HOURLY INTERVALS AFTER FEEDS OF BOILED AND RAW MILK

Case.	Sex.	Milk.	Calcium mg. per 100 c.cm.				
			Fasting.	½ hr.	1 hr.	1½ hrs.	2 hrs.
16	F.	R.	1·4	80·3	39·5	38·6	38·0
		B.	34·6	88·8	56·3	—	52·9
3	F.	R.	5·8	50·4	40·6	34·8	19·2
		B.	6·6	59·9	62·1	66·1	30·0
12	M.	R.	1·7	23·6	33·3	19·2	22·9
		B.	2·7	52·6	17·8	31·8	44·8
2	M.	R.	0·53	42·6	60·5	59·2	65·9
		B.	2·6	56·8	67·0	79·3	38·0
13	M.	R.	6·3	48·7	37·1	37·1	34·8
		B.	1·1	91·4	50·4	59·0	65·2
9	M.	R.	1·3	55·9	57·3	49·8	45·8
		B.	3·1	68·6	70·0	66·2	8·8
11	M.	R.	5·6	37·0	37·5	37·6	16·7
		B.	11·7	46·6	40·5	36·3	41·8
10	F.	R.	3·4	38·9	56·4	54·4	63·6
		B.	3·9	43·8	49·3	52·4	57·1
1	M.	R.	—	37·0	34·6	—	—
		B.	—	73·0	41·5	—	—
15	M.	R.	9·3	40·5	46·9	37·2	24·3
		B.	45·7	33·4	39·7	36·9	—
4	M.	R.	2·4	46·4	57·2	52·8	24·0
		B.	9·4	48·0	52·2	64·8	—
6	M.	R.	—	50·4	55·6	58·8	54·4
		B.	8·4	16·0	23·2	27·3	25·4
14	M.	R.	1·6	46·0	34·8	32·8	34·1
		B.	4·4	44·7	49·8	49·4	22·0

R. = raw milk; B. = boiled milk.

TABLE III

SHOWING CHANGE IN NON-PROTEIN NITROGEN IN FILTERED GASTRIC CONTENTS AT HALF-HOURLY INTERVALS AFTER FEEDS OF BOILED AND RAW MILK

Case.	Sex.	Milk.	Non-protein nitrogen mg. per 100 c.cm.				
			Fasting.	½ hr.	1 hr.	1½ hrs.	2 hrs.
16	F.	R.	40·2	62·5	48·1	14·7	30·6
		B.	39·6	60·5	40·0	8·6	19·8
3	F.	R.	67·5	58·7	58·8	90·9	181·8
		B.	66·6	106·3	166·6	222·2	111·1
12	M.	R.	35·3	66·6	47·6	8·2	39·2
		B.	36·5	65·2	47·8	12·5	28·9
2	M.	R.	100·0	69·5	100·0	126·9	145·4
		B.	97·5	100·0	126·9	145·4	125·0
13	M.	R.	82·6	97·08	117·5	133·3	106·3
		B.	80·9	68·9	93·0	103·0	136·9
9	M.	R.	46·7	66·6	71·4	71·4	71·4
		B.	46·7	43·6	90·9	181·8	181·8

NON-PROTEIN NITROGEN

The amount of non-protein nitrogen was very constant in the fasting juice of each of the six cases examined. In four the values for raw and boiled milk were very close

at each half-hour period. In the other two the values for boiled milk were greater, showing that its protein had been more rapidly digested than that of raw milk.

Of the 24 pairs of half-hourly samples for raw and boiled milk half showed higher values with boiled and half with raw milk, so that there is no evidence of better gastric digestion of the protein of raw milk than of boiled milk.

It is clear from these results that there is no significant difference in the gastric digestion of boiled and raw milk, and it may be concluded that digestion of milk is not adversely affected by boiling.

We desire to thank Prof. G. B. Fleming and Dr. N. Morris for suggesting this investigation and for their helpful criticism. The work of one of us (J. W. O.) was done during the tenure of a McCunn medical research scholarship.

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DISPLACEMENT OF THE INTERNAL EPICONDYLE INTO THE ELBOW-JOINT

FOUR CASES SUCCESSFULLY TREATED BY MANIPULATION

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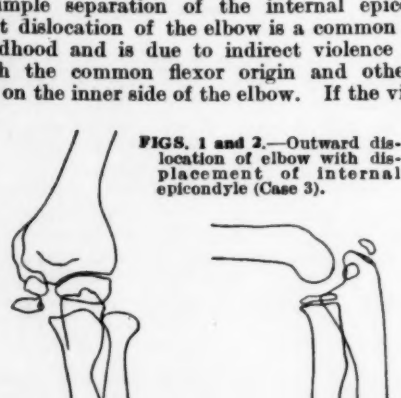
ORTHOPÆDIC REGISTRAR, LIVERPOOL ROYAL INFIRMARY

THE following cases are recorded in order to draw attention to the possibility of successful manipulative reduction of displacement of the internal epicondyle into the elbow-joint. This condition is not very common but probably is not as rare as is supposed.

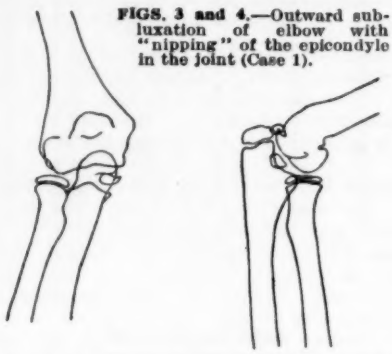
A simple separation of the internal epicondyle without dislocation of the elbow is a common injury in childhood and is due to indirect violence acting through the common flexor origin and other soft tissues on the inner side of the elbow. If the violence



FIGS. 1 and 2.—Outward dislocation of elbow with displacement of internal epicondyle (Case 3).

is more severe a pure outward dislocation of the elbow or a combined outward and backward dislocation results. The former always results in an ulnar nerve lesion and is the type in which imprisonment of the detached epicondyle in the joint is most likely to occur. Two degrees of displacement are met with clinically.

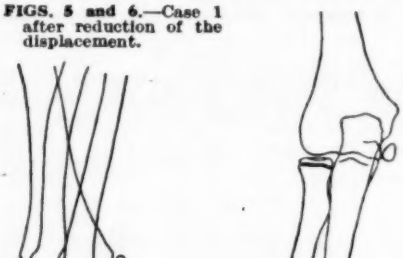
1. A gross outward dislocation of the elbow exists. The epicondyle is pulled downwards and then outwards by the attachment of the common flexors until it lies below the trochlear articular surface of the humerus (Figs. 1 and 2, Case 3). In this type of case manipulative reduction of the dislocation may displace the epicondyle out of harms way. Alternatively, as the dislocation is reduced, the epicondyle becomes



FIGS. 3 and 4.—Outward subluxation of elbow with "nipping" of the epicondyle in the joint (Case 1).

wedged between the trochlea and the sigmoid cavity of the ulna, producing a picture essentially similar to the second type of case.

2. In this type there is a slight outward subluxation of the elbow and the internal epicondyle is interposed between the articular surfaces of the ulna and humerus (Figs. 3 and 4, Case 1). There has probably been a dislocation of the elbow at the time of injury but spontaneous reduction has occurred. I have been unable to find any record of successful



FIGS. 5 and 6.—Case 1 after reduction of the displacement.

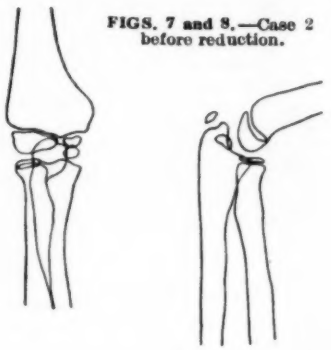
manipulative reduction of this type of displacement—chiefly I think because displacement of the epicondyle into the joint is associated in the minds of surgeons with operative reduction or removal, and consequently no attempt is made to reduce the displacement by manipulation. Two of the four cases recorded here belong to this type and have been successfully reduced by manipulation.

CASE RECORDS

CASE 1.—A girl, aged 13, was seen by me on June 16th, 1933. On the previous day she had fallen, injuring the left elbow; the exact mechanism was not known. The elbow was very swollen and blistered and the diagnosis was not made clinically. There was a partial ulnar nerve lesion. Radiograms showed a displacement of the internal epicondyle into the joint. Tracings of the radiograms show the typical appearances (Figs. 3 and 4). In the antero-posterior view the internal epicondyle is seen with its fractured surface upwards lying in the space between the ulna and the trochlear epiphysis. In the lateral view it occupies the sigmoid cavity of the ulna.

I decided to attempt manipulative reduction before resorting to open operation. Under nitrous oxide anæsthesia the forearm was strongly abducted at the elbow so as to open the inner side of the joint. This released the "sandwiching" of the epicondyle, and during flexion and extension movements of the elbow the epicondyle was felt to slip out of the joint. If the forearm is kept supinated and the fingers are extended, tension is exerted on the common flexor origin and this may aid reduction. Fig. 5 is a tracing of a radiogram taken with the elbow flexed after reduction. This shows good apposition of the epicondyle to the humerus and it is lying in its normal position.

The elbow was immobilised in flexion for three weeks, and after this movements of the elbow were allowed to return naturally without any special treatment. Commencing recovery of the ulnar nerve lesion was noted on Sept. 7th, and the elbow movements on this occasion were full in flexion and radio-ulnar movements, and extension was possible to 180°. The final condition (Jan. 4th, 1934) was as follows: ulnar nerve lesion completely recovered; elbow movements, flexion, and radio-ulnar movements normal; extension 180° (normal



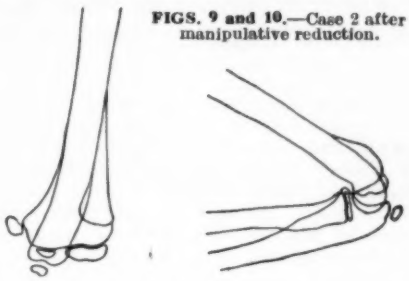
FIGS. 7 and 8.—Case 2 before reduction.

side 190°); no symptoms. Radiogram (Fig. 6) shows fibrous union with displacement of the epicondyle downwards from its normal position. This is a common sequel of fractures and epiphyseal separations of the epicondyles and has not prejudiced function in this case. It is possible that extension movements of the elbow were allowed too early in this case and consequently union of the epicondyle prevented.

CASE 2.—A boy, aged 10, was seen by me on Dec. 16th, 1933, having fallen two days previously and injured his left elbow. There was considerable swelling round the elbow and tenderness localised over the internal aspect of the lower end of the humerus. There was no circulatory disturbance but a definite ulnar nerve lesion was present. X rays (Figs. 7 and 8) show displacement of the internal epicondyle into the joint, the appearances being almost identical with those of Case 1. I manipulated the elbow in the same manner as in Case 1 and during manipulation the epicondyle was felt to slip out of the joint. X rays (Figs. 9 and 10) show reduction of the displacement. The epicondyle is lying slightly higher up the shaft of the humerus than its normal position. This case is still under treatment. There is limitation of the last 20° of extension and a partial ulnar nerve lesion persists. An anterior transposition of the ulnar nerve will be necessary if the nerve lesion does not recover completely in the next month or two.

CASE 3.—On searching the records of the Liverpool Royal Infirmary for fracture cases for the last seven years I was able to find twelve other cases of displacement of the internal epicondyle into the elbow-joint. With one exception these had all been treated by open reduction of the displacement, and in most cases an anterior transposition of the ulnar nerve. One case, however, had been successfully reduced by manipulation. This case belongs to the first category described above in which a gross outward dislocation of the elbow is present. Figs. 1 and 2 illustrate the appearances in this case. Mr. A. L. Kerr saw the patient on Sept. 11th, 1928, and the displacement of the epicondyle was reduced by manipulation only. The ulnar palsy recovered completely in three months, and the final condition was: good function in the elbow with 15° of limitation of full extension.

CASE 4.—A man, aged 22, fell off his horse while riding on Dec. 2nd, 1933, and was seen by Mr. R. Watson Jones the



FIGS. 9 and 10.—Case 2 after manipulative reduction.

same day. There was an outward and backward dislocation of the elbow present and the internal epicondyle had been avulsed and was lying below the trochlear surface of the humerus. The dislocation was reduced by Mr. Watson Jones by manipulation and the epicondylar fragment restored to its normal position. There was no nerve lesion in this case. With a view to preventing fibrous union of the epicondylar fragment, the patient was operated on on Dec. 19th and the epicondyle sutured accurately into position.

SUMMARY

(1) Four cases are described in which displacement of the internal epicondyle into the joint has been reduced by manipulative measures alone. (2) There is no reason to suppose that recovery of the ulnar nerve lesion or the ultimate function of the elbow will be prejudiced by this line of treatment. (3) Stress is laid on the importance during manipulation of opening the inner side of the joint so as to allow the internal epicondyle to retrace its original displacement. (4) In the absence of operative treatment there is the possibility of fibrous union of the epicondyle occurring but this is of no importance. (Fibrous union of the epicondyle also occurred in two cases which had been submitted to open operation and in which the epicondyle had been sutured in its correct position.) (5) It appears likely that attempted manipulative reduction will be successful in a high proportion of cases seen within the first few days, and the necessity for open operation avoided, with consequent shortening of convalescence and avoidance of any possible complications.

I am indebted to Mr. Watson Jones for the notes of the fourth case in this series and for his kind permission to publish the other three cases.

MIDDLESEX HOSPITAL.—The annual report records that 7987 patients were admitted last year, whose average weekly cost was £4 13*s.* 4*d.* Their average stay was 20·38 days, and their total cost £13 11*s.* 9*d.* Out-patients numbered 47,995, and their 264,911 attendances were a large increase. They cost 9*s.* 7·94*d.* each. The year closed with a surplus of £3512, which is accounted for by the unusual sum received from legacies. Dr. W. Essex Wynter, consulting physician to the hospital, has rounded off his gift of Bartholomew Manor, Newbury, as a home for retired Middlesex Hospital sisters and nurses, by the purchase of two more ancient cottages which he has restored and put into use. Eleven former sisters and nurses now have their homes there, and others are shortly to join them.

SEVERE SERUM SHOCK

A CASE AND AN INVESTIGATION

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THE rare phenomenon usually called "anaphylactic shock" always attracts attention, because it is an unexpected and dramatic outcome of a simple procedure almost always performed without mishap. So rare, indeed, is it in humans that few practitioners ever see a case. It has been calculated [1] that the proportion of persons liable to show severe anaphylaxis is not more than 1 in 20,000.

THE CASE

At the beginning of May, 1933, five cases of scarlet fever were admitted to hospital within four days. The patients were children who attended the same class of an elementary school within the burgh. Inspection of the pupils of the affected class by one of us on May 8th elicited the source of infection to be a girl with the remains of the rash still visible. The patient, a well-nourished child of 8 years, was removed to hospital, and there 5 c.cm. of scarlet fever antitoxin (concentrated) out of a 10 c.cm. phial was injected into the muscle of the thigh. Three minutes later she suddenly began to have difficulty in breathing, and after struggling into a sitting posture with the arms held firmly to the sides and the hands clenched, gasped for breath. The colour became greyish-blue and the face distorted, with the mouth pulled to the right and the lips retracted over the teeth. The child was at once put on her back, but she writhed about on the bed and ultimately lay on her left side in a state of deep coma. Respiration was suspended and the colour became an extremely livid blue,[2] as in death from asphyxia. The pupils were contracted, but the pulse was full and bounding.

Treatment and course of illness.—At once artificial respiration was initiated with the jaw held forward and, in approximately one minute, a sighing type of respiration, attended by a rattle of mucus in the air-passages, was re-established for a few moments. The lividity of the skin, however, remained. The patient was at once given gr. 1/100 of strychnine sulphate and ℥ 8 of adrenaline solution hypodermically. Almost at once respiration ceased again, accompanied by a tonic spasm of all the muscles. The radial pulse became imperceptible, although the heart was felt to be beating tumultuously. Artificial respiration was recommenced, along with rhythmic traction of the tongue. The heart area was fomented, the mouth and lips rubbed with brandy, and the foot of the bed elevated about two feet. The patient voided urine during the asphyxial spasm. After a few minutes breathing of a more normal type became established, the livid colour began slowly to fade, and consciousness gradually returned.

The child remained dazed for half an hour afterwards and a degree of cyanosis was present for about two hours, while the radial pulse remained imperceptible for a similar period and then gradually grew stronger. The scarlatinal rash faded during the attack and began to reappear with the disappearance of the cyanosis. Subsequently the child was very thirsty but slept well during the night. Next morning she was rather pale, but her pulse was quite strong. There were a few urticarial weals on the abdomen. Progress after this was normal and free from other serum reactions, and the child was discharged from hospital on June 10th in perfect health.

Sera from the same batch had been used on other patients in this ward without any subsequent manifestations and, moreover, the remaining 5 c.cm. of serum in the 10 c.cm. phial opened for this patient was administered at the same time to another patient, whose clinical behaviour subsequently was entirely normal.

Previous history.—Apart from measles, whooping-cough, mumps, and influenza the child had enjoyed excellent health. She had had neither hay-fever, asthma, migraine, nor a previous injection of horse serum. No animal intolerance had been noted. Ordinary colds in the head were admitted, but no seasonal colds suggestive of hay-fever. Her own doctor corroborated this history.

THE INVESTIGATION

During convalescence attempts were made to inquire into the pathogenesis of this susceptibility and to evaluate the various modes of testing for the condition.

Scarification tests.—These were carried out, a week after admission, on the patient and two control subjects, one of whom had also previously had an injection of 5 c.cm. of scarlet fever antitoxin. The substances applied were undiluted ox, human, pig, and sheep sera, along with two samples of therapeutic horse serum from different makers. None of the three subjects showed any response. Two group-protein extracts (meat and bacteria) were similarly used without any reaction.

Conjunctival and intradermal tests.—Beginning on the twenty-first day, these were carried out on successive days on the patient and one other control subject, using varying dilutions of serum in a buffer solution of isotonic saline. The results are given in tabular form.

Material.	Method.	Dose.	Result.	
			Patient.	Control.
1. Buffer solution	Conj.	2–3 drops.	Neg.	Neg.
	Intrad.	0·1 c.cm.	,,	
2. H.S. (1 : 1000)	Conj.	2–3 drops.	Neg.	Neg.
	Intrad.	0·1 c.cm.	Sl. erythema and œdema.*	
3. H.S. (1 : 100).	Conj.	2–3 drops.	Neg.	Neg.
	Intrad.	0·1 c.cm.	Marked weal, erythema and œdema.†	
4. H.S. (1 : 10)..	Conj.	2–3 drops.	Neg.	Neg.
5. H.S. (pure) ..	Conj.	2–3 ,,	Neg.	Neg.

H.S.=horse serum; conj.=conjunctival; intrad.=intradermal; neg.=negative; sl.=slight.
* 1–6 hours after. † ½–6 hours after.

The reaction obtained on the patient following intradermal injection with horse serum in a dilution of 1 in 100 was the formation within half an hour of a marked weal with a surrounding zone of erythema of about 2 inches diameter, which gradually faded and was succeeded by a larger ovoid area of œdema reaching a maximum length of 3 inches within six hours afterwards. These changes are comparable with the triple reaction of Lewis.[3]

Transference of sensitiveness.—(*a*) Ten c.cm. of blood were withdrawn from the patient and allowed to coagulate; 0·1 c.cm. of the serum was injected intradermally into a second patient, who had previously been tested by the intradermal method and found insensitive. A latent period of 48 hours was allowed to elapse and the sensitised site was reinjected intradermally with 0·1 c.cm. horse serum in 1 : 10 dilution. A very mild erythema with local œdema lasting eight hours followed. A control injection into an untreated area of the skin gave no reaction. (*b*) An attempt was made to transfer the condition to guinea-pigs. (Dr. M. J. Miller, of Ayr County Laboratory, very kindly conducted this part of the test.) A guinea-pig was given an intradermal injection of the patient's serum and, after two hours, an intradermal injection into the same site of pure horse serum. There was no abnormal response. A second guinea-pig was given 1 c.cm. of the patient's serum hypodermically and

after two and a half hours, 1 c.cm. of pure horse serum by the same route. The animal betrayed no abnormality and a post-mortem examination some three weeks later revealed healthy organs.

Familial investigation.—Both parents and the two other children of this family were submitted to skin tests with horse serum. Using a dilution of 1 : 100, there was no abnormal response in any case.

Specificity.—Final intradermal tests on the sensitive patient with the sera of the goat and cow in a dilution of 1 per cent. in the same buffer solution yielded reactions similar in nature to that obtained with horse serum, but more extensive in degree. This was particularly the case with goat serum, for the subsequent œdema was noted after six hours to cover the anterior half of the forearm with the exception of about two inches proximal to the wrist-joint. Three control patients had the cow and goat sera administered intradermally and showed no response.

DISCUSSION

Although the similarity of the events referred to in the early (1903–1907) studies of Richet,[4] Arthus,[5] and Theobald Smith [6] on animal anaphylaxis, and the researches of von Pirquet and Schick [7] on serum reactions in man, has led to a confused terminology, it has been evident that, as with immunity, there are two types of supersensitiveness, the one artificial and the other natural.[8]

According to Lamson,[9] the onset of serious symptoms of shock following horse serum injection is much more common in patients who have not been artificially sensitised by previous serum injection and who manifest their idiosyncrasy by some form of horse intolerance. Little experimental work has been carried out on the naturally supersensitive, and hence it has been assumed from work done on artificially sensitised individuals that desensitisation is possible and that the condition is specific. Mackenzie and Hanger [10] have pointed out that desensitisation of the naturally supersensitive individual had not yet been shown to be easily possible, while the case reported by us seems at least to throw the assumed specificity of natural supersensitiveness open to question. Mackenzie [11] has noted heterologous skin reactions with other sera in individuals sensitised to horse serum, and in our case the reactions with other sera were equally or more severe. The observations of Prausnitz and Kustner [12] and of Cooke and Spain [13] regarding the transference of sensitiveness have been corroborated.

The patient was evidently supremely sensitive, for the acute symptoms appeared within three minutes of the intramuscular injection. Would it have been possible to detect this sensitiveness in advance, and can we be certain that the reactions developing after the intradermal administration of horse serum, injected days after the therapeutic serum had been given, would have shown themselves had the patient been tested on admission? We shall never know. Nor are all writers convinced that the intradermal method would have given warning in advance. Some authors have suggested that a minute dose of serum should be administered by the route to be used for the main injection. In view of the intense anaphylactic shock this child showed, we think it highly probable that a preliminary intramuscular injection of even a minute dose of serum would have caused symptoms striking enough to warn us that the child belonged to this dangerous group. What then? Presumably we should have no option, if we decided to continue serum to the required therapeutic dose, but to give a long series of divided doses [14] commencing with perhaps 0·05 c.cm. of serum and increasing cautiously, keeping 1 c.cm. of adrenaline available for instant injection if troublesome symptoms appeared.

SUMMARY

We report a case of severe anaphylactic shock following the first injection of horse serum, where success attended efforts to resuscitate a patient who would in our opinion certainly have died otherwise. The value of artificial respiration coupled with prompt administration of adrenaline is clearly demonstrated.

The tests applied to the patient in convalescence are interesting for the reason that, while they confirm certain experimental work, they show that natural supersensitiveness is not necessarily specific.

We are indebted to Dr. R. A. O'Brien, of the Wellcome Research Foundation, for material help in the investigation and valuable suggestions and advice in writing this paper.

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BACILLUS TUBERCULOSIS IN BUTTER

A METHOD OF EXAMINATION

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There are certain technical difficulties in carrying out the biological test for the presence of *B. tuberculosis* in butter. The following method obviates some of these. All operations must of course be carried out aseptically and all apparatus, distilled water, and saline used must be sterile.

From 60 to 100 g. of butter are taken and melted at a temperature of 40° C. in 150 c.cm. of distilled water in a beaker. This is then pumped twice through a "cream making" machine into a centrifuge tube. It is next centrifugalised at 3000 revolutions per minute for half an hour. The cream is then removed with the aid of a stout wire, the supernatant fluid poured off, the deposit suspended in 5·0 c.cm. of saline, and inoculated subcutaneously in equal amounts into the antero-internal aspects of the right thigh of each of two guinea-pigs, the inguinal glands having been previously squeezed after the method of Bloch.[1] The animals are killed after a lapse of one month, and examined with great care for the presence of tuberculosis arising from the site of inoculation.

By this method 40 samples of Danish (15) and New Zealand and Australian (25) butter have been examined and the organism was found in one of the Danish samples. This is rather surprising, since these butters are usually believed to be made from cream which has been efficiently pasteurised. It is recognised that the butter may have been infected after production; but it is none the less disconcerting to those who use these butters principally because of their supposed freedom from infection with *B. tuberculosis*.

[1] Bloch, A.: Berl. klin. Woch., 1907, xliv., 511.

MEDICAL SOCIETIES

ROYAL MEDICO-PSYCHOLOGICAL ASSOCIATION

THE annual meeting of the Association took place at the Guildhall, Northampton, under the presidency of Dr. DANIEL F. RAMBAUT (St. Andrew's Hospital, Northampton), who gave an address on

Some Mental Treatments

In 40 years he had seen many changes in treatment of mental disease. Good nursing was essential. Originally the mental nurse was but a warder or keeper, whose purpose was to protect the public, not the patients. The great change from that was initiated by Pinel in Paris, and William Tuke in York Retreat, coupled with the great reforms of Lord Shaftesbury, embodied in the Lunacy Act of 1845 and the Lunacy Commission of 1859. The greatest credit for the change to the present efficient system must be attributed to the committee of the Medico-Psychological Association which, in 1890, resolved that it was advisable (1) to institute a system of training attendants in asylums, (2) to establish examinations in order to test the proficiency of candidates, (3) to grant certificates to those who succeeded at examinations. Commencing with 106 certificates, the number of candidates last year was 6920. Under the Association's scheme nurses could consider themselves established, could look forward to promotion, and to filling comfortable positions. One effect of the training was to show that roughness and tactlessness were due to ignorance, and nurses and attendants came to realise that they were treating illness. The quality of a nursing staff was largely dependent on the wages offered, but it depended partly also on the reputation of a particular hospital for making nurses comfortable and happy both at work and off duty. Nurses at St. Andrew's were encouraged to pursue their studies in general hospitals and to complete their general training there, and sisters having this dual training were appointed to senior posts, and invariably into the acute wards. He, like others, had found distinct benefit from having female nurses in male acute wards. Many cases of apparently unavoidable artificial feeding had on this account been fed naturally. He thought the example of Holland should be followed in giving young nurses a course in general education and knowledge, and this should be given by each mental hospital as part of the general course of instruction.

The President then sketched in detail the evolution of occupational therapy in mental treatment. Selection of the most suitable form of activity was of the greatest importance. The provision of reception hospitals he regarded as of great importance, as classification was essential for proper scientific investigation and treatment. Most mental hospitals were too large, their wards contained too many patients, and there was little possibility of therapeutic isolation or of differential grouping. The St. Andrew's Hospital Committee had now erected a reception hospital, Wantage House, whose entrance was separate from the main hospital, and it had its own gardens and recreation grounds. Its patients did not come into contact with the more chronic cases. Here, too, the distinctive features of patients who did not quickly recover could be carefully studied. The main aim of a reception hospital for acute psychoses must be the provision of adequate facilities for psychological and physical treatment. He stressed the value of hydrotherapy in the psychoses of toxic origin. Through the somatic treatment of mental disorders the speaker had seen a complete change introduced into the spirit of a mental hospital, as patients felt they were undergoing care for an illness, and were anxious to coöperate. This feeling had gradually permeated the whole hospital, with a corresponding improvement in the atmosphere.

Mrs. ELEANOR SLAGLE (Director of Occupational Therapy, New York State Department of Mental Hygiene) read a paper on

Occupational Therapy

She said that in the various institutions for mental or defective patients in New York State there were now 200 patients to each physician, but the proportion aimed at was 1 to every 150. Statistics showed that 45 out of every 1000 born in the State would, at some period of their lives, be affected with mental disorder, the expectancy being higher among women than among men. Last year 34,548 patients had occupational treatment, and great improvement was noticeable as a result. The aim was the social rehabilitation of the patients and habit training was specially attended to. Mrs. Slagle gave detailed schemes for various grades, and said that the medical staff prescribed the actual treatment programme of individual patients, and the nurse was shown the value of harmonious coöperation. Activities included the training of nurses and attendants.

Prof. W. M. von d. SCHEER (Grotingen, Holland) said that in the psychoses, which disorganised the higher functions of man, numerous therapeutic successes had been achieved, notably malaria therapy in dementia paralytica, salvarsan and tryparsamide therapy for cerebral syphilis, treatment of digestive apparatus in toxæmic psychoses, the removal of septic foci in cases of schizophrenic derangement, the Somnifaine sleep treatment of manic-depressive psychosis, and non-specific stimulation treatment in various other psychotic conditions. Yet the specialty was still to a large extent powerless in direct treatment. Great hope centred in occupational therapy. He declared that prolonged restlessness in wards need not occur, that baths were scarcely ever needed as a means of restraint, and that it was very seldom necessary to use isolation cells. Narcotics, too, could be reduced to a minimum. It was clear to him that the greater number of cases of unsocial behaviour had little to do with the specific psychoses as such; the behaviour departures were largely due to a disordered nervous system which was reacting wrongly to the stimuli of the external world. In Holland, work-therapy in mental hospitals had reached a high level. In his own institution no difficult work was expected of patients, and they worked in the immediate neighbourhood of the wards, so that disturbing elements could be at once removed. Promotion of patients to a higher class as a reward of effort always had a good effect, as did encouragement to take walks unattended. In the whole community order and self reliance were aimed at.

Dr. HENRY YELLOWLEES read a paper on

Modern Psychiatry and Mental Hospitals

He reminded members of the large share taken by the Association in organising the teaching of

generations of mental nurses, and greatly enhancing the prestige of psychiatry. Until the war most of the practical improvements, discoveries, researches, and reforms in connexion with psychiatry emanated from mental hospitals; a galaxy of "asylum men," as they were called, brought honour to themselves and the specialty by their ability and devotion. But since the war a change had come about associated with two important developments. The first was the greatly increased attention devoted to research by a multiplicity of research workers. In most of the mental hospitals of any size the clinical and pathological laboratories and staffs compared most favourably with those of any general hospital in the country. Yet research in psychiatry at the present time bore, on the whole, far less relation to clinical work with and for patients than in any other branch of medicine, for pre-eminently in psychiatry the physician dealt with personalities. It should not be a question as to the results which "A" had collected, of "B's" investigation into the chemical properties of certain organs and tissues removed by "C" from 200 cadavers of persons who, in "D's" opinion, once suffered from schizophrenia. That had no message for clinical psychiatry. There was too great a gulf between research and the clinical phase of psychiatry. It was assiduously preached, and had become widely accepted, that not only was mental hospital experience needless for the training of the psychiatrist, but it was a waste of time, if not indeed harmful. The situation needed to be frankly faced.

The second great post-war change was the great development of medical psychology, the evolution of the modern theories of the neuroses, and the amazing increase in the recognition and effective practice of psychotherapy. The latter was quite unfitted for institutional work; so far as the psychoses were concerned it was a broken reed, as mental hospitals were not the right places for neurotic patients. The neurologist or neuro-pathologist pointed to his research laboratory "free from the taint of lunacy," and, on the other hand, the trouble with the psychologically minded psychotherapist was that he lacked clinical training in psychiatry, and so was forced to avoid the formality of diagnosis in every second or third case which he treated. This the speaker regarded as a sad and serious situation which ought to be faced. A large number of highly trained scientific men and women gloried in the fact that they had had little or no experience in a mental hospital, and they neglected no opportunity of belittling the work done in mental hospitals and the treatment to be gained in them. Why did not psychiatrists speak in their own defence? The polite and good-mannered depreciation of which he was complaining was much more deadly than any attacks by a poorly informed yellow press, and the profession as a whole should inform itself on the subject and stop the misrepresentation as far as possible. The Board of Control was the best friend that either the patient or the medical superintendent could have, yet the mass of the public seemed to fear and distrust that body. If more effect had been given to its views in the Mental Treatment Act, that Act would have been a better measure.

Dr. Yellowlees suggested that instead of keeping mild or recoverable or well-behaved cases out of mental hospitals, the confirmed and chronically insane should be removed into special institutions. By removing the supply of cheap unskilled labour the whole industrial and social aspect of the mental hospital would be altered, but this course would emphasise the strictly medical aspect of it, and it ought to satisfy those whose cry was for a curative clinic. His only other suggestion was a better education of both professional and public opinion. Something might be done towards this by the issue of a pamphlet which nailed to the counter some of the grossest of misrepresentations.

Dr. HAMILTON MARR (Scottish Board of Control) did not agree with Dr. Yellowlees' proposal to take from mental hospitals the chronic and apparently incurable cases; rather would he extend the sphere of mental hospitals to include care of cases before they became certifiable. He commended the example set by two or three mental hospitals in Paris, where members of the staff were required to have had four years' practice in mental institutions and to have passed two special examinations.

Dr. ISABEL WILSON suggested it might be possible to create assistantships in mental hospitals for six to twelve months for the benefit of those who had started analytical work.

Prof. D. K. HENDERSON said it was not his experience that the average junior medical officer assistant coming into a mental hospital minimised the importance of clinical psychiatry. Like Dr. Marr, he objected to the proposal to shift chronic patients from the mental hospital and place them into special institutions by themselves. These cases needed the same standard of care that other kinds of patients did.

Dr. ROLF STRÖM-OLSEN (Cardiff Mental Hospital), in association with Dr. MURIEL L. MCCOWAN, read a paper on

Prolonged Narcosis in Mental Disorder

Though the value of prolonged narcosis in mental disorder had been well recognised in Switzerland, Germany, Holland, and the United States, there had been as yet little tendency, he said, to use it in this country. A statement as to its dangers had deterred many psychiatrists from giving the method a trial. In the search for a perfect narcotic 40 substances had been tried. This paper set out results achieved in 107 mixed cases of mental disorder. In 117 of 128 separate treatments somnifaine was used, in 9 veronal, in 2 Dial. It was not yet possible to say in what forms benefit was most likely to accrue from this, as the rationale of the treatment was not properly understood. The therapeutic action seemed, however, to depend on two phenomena: first, the removal of inhibition or the discharging of libido from repressed complexes; and, secondly, the stage of narcotic sleep. This series of cases suggested that a degree of narcosis was required which would cause a deep sleep, as a "twilight sleep" was, in most cases, insufficient. In schizophrenia the best results were achieved in the excited or depressed phases. In this present series the most gratifying results were in 13 cases of psychoneurosis. Reassurance and suggestion were constantly used beneficially as additional means. He described in detail the technique followed, and tabulated the results, giving histories of a variety of cases.

Dr. K. C. L. PADDLE (Caterham Mental Hospital) said that the cerebro-spinal fluids of 2000 cases of mental deficiency of both sexes, and of all grades and ages, were examined. In 1500 of these cases, observations were made on the after-effects of lumbar puncture. 17 per cent. of these cases developed post-lumbar-puncture symptoms, 14·2 per cent. vomited, 6·8 per cent. had headache, and 0·73 per

cent. pyrexia up to 101° F. The incidence of vomiting was nearly twice as high in females as in males, being 20·1 per cent. and 10·5 per cent. respectively. It was also higher in the feeble-minded group than in the imbecile or idiot group. There was a direct relationship between the rate of flow of the cerebro-spinal fluid and the incidence of post-lumbar-puncture symptoms. Where the former was rapid the incidence tended to be high, and where it was slow the incidence was relatively low. The tests used on the cerebro-spinal fluid were the Wassermann reaction, cell estimation, Pandy and Lange's colloidal gold; also the acetic anhydride of Boltz. Many pseudopositive Pandy and Boltz reactions were given by the fresh cerebro-spinal fluid. Of the 2000 cerebro-spinal fluids examined, 55, or 2·7 per cent., were abnormal. The Wassermann reaction was positive in 19 cases; excess of cells existed in 32, excess of globulin in 44, and the colloidal gold reaction was positive in 30. 23·9 per cent. of congenital syphilitics had abnormal cerebro-spinal fluids. The incidence of abnormal cerebro-spinal fluids was higher in cases of mental deficiency complicated by epilepsy or paralysis than in uncomplicated cases. The cerebro-spinal fluid of only 1 out of 54 Mongolian idiots gave a positive Lange's colloidal gold test. In the remaining 53 the cerebro-spinal fluid was normal in every respect.

During the meeting the Gaskell Prize and Gold Medal were presented to Dr. William Blyth, of Paisley District Mental Hospital, the divisional prize to Dr. E. J. Fitzgerald, and the bronze medal and prize to Dr. H. C. Beccle, of Springfield Mental Hospital, Tooting.

At the business meeting Dr. James Whitwell, who has done much for the library of the Association since 1927, and Mr. L. G. Brock, chairman of the Board of Control, were unanimously elected honorary members of the Association.

ROYAL SOCIETY OF MEDICINE AND MEDICO-LEGAL SOCIETY

A JOINT meeting of the section of obstetrics and gynæcology of the Royal Society of Medicine with the Medico-Legal Society took place at the headquarters of the former, and was very largely attended. The chair was taken by Prof. W. BLAIR-BELL, president of the section. The subject of discussion was

Sex: its Nature and Abnormalities

considered from Biological and Legal Points of View. Prof. F. A. E. CREW (Edinburgh), in opening, said it was customary, when seeking an understanding of the attributes of man in a complex society, to make a broad survey of similar phenomena in other forms of life. But human society presented a unique biological phenomenon, and it was doubtful whether there existed anything like it in the experimental material available to the biologist. Among animals there was no sin, but it must be assumed there was much crime, and it was to be doubted whether the student of human behaviour could hope to find explanations of things which puzzled him by turning to the rabbit and the bird. The biologist was no longer concerned with a search for an understanding of the nature of sex; he contented himself, in this stage of development, with a discussion of the analysis of the differences which permitted him to regard one individual with one kind of organisation and characterisation as a male, and another and contrasted kind of organisation as a female. In fact the more one knew of sexual difference, the less one felt one knew about sex itself. The mating of two dissimilar individuals, bearing the egg and the sperm, commonly resulted in the union of two dissimilar gametes, and it was easy to conclude that the meaning of sex could only be recognised by bringing it into essential relation with reproduction, the preservation of the species. Sexuality and reproduction, though commonly inter-related, could be completely dissociated. Many advantages had been gained as a result of our mode of evolution, but many more had been lost. In an ever-increasing number of species the existence of a sex chromosome had been demonstrated, and it was further established that in a considerable number of instances there was a dissimilarity in the matter of the sex chromosome constitution. The male was constitutionally heterogametic, the female constitutionally homogametic. Abnormalities in the distribution of the sex chromosomes were always associated with abnormalities in the sex characterisation of the individual. In one kind of fly it was possible to draw a line from its tip to its tail and demonstrate that all the characters on one side of its body were male, whereas all those on the other side were female. In that species of fly there could be a graded series of abnormal sexual types. In one fly there might be only one-sixteenth of the body male; according to the time at which it happened, there would be a larger or smaller area of male tissue in a creature which was otherwise preponderatingly female. Male-determining factors could differ amongst themselves in potency, and the female-determining factors could vary amongst themselves. Males could derive determinations from either father or mother, and as a result there could be an individual containing both male and female factors.

As a result, he asked subsequent speakers to try to define what was male and what was female, as, frankly, he did not himself know. In the case of binelia, a marine worm, at one stage the larvæ floating on the surface were all alike, and their sex was subsequently determined by accident. If they settled on the long proboscis of the female they became males, but if they settled well away from the female they became females. The biologist therefore, if appealed to on this matter, would probably confess that he had no knowledge as to the nature of sex.

Mr. B. P. WIESNER, Ph.D. (Edinburgh Biological Laboratory), spoke on mechanisms which regulate sex behaviour and associated activities. This analysis could be carried out on an entirely psychological basis. No such analysis had been attempted, and he did not think it would be as long as the historical attitude of the psycho-analyst ruled. In the past much confusion had resulted from the identification of motivation concerned with the offspring with that of sex drives. In humans complicated outside factors operated, but in the case of the rat, the male animal tried to mate with any other animal of its kind or of similar appearance, whether such animal be male or female; distinction of sexes in this matter was not a primary activator in animals. Selection of the female by the male was determined rather by the opposition on the part of the male to sex attentions by another male, and only the female would assume the necessary posture for reproduction. The testes could be removed after puberty without interference with the sex life of the animal, but complete removal of the anterior lobe of the pituitary resulted in the complete disappearance of all sex drive and the assumption of complete sex indifference, this changed attitude coming on 24 hours

after the operation and lasting for the whole of the remaining life. This fact assigned great importance to the nature of the secretion of the anterior lobe of the pituitary. In hypophysectomised animals it was possible to restore activity without restoring sex activity. It was most probable that the actual physiological state of the individual to some extent determined its behaviour in any given situation. In the case of rats which were wild and brutal this attribute was lost a few days after removal of the anterior lobe of the pituitary, and it seemed that many of the factors responsible for highly dynamic motivation were associated with factors responsible for sex behaviour. Cushing's cases of adenoma of the pituitary had loss of the libido. In the female the conditions were more complicated, but there were a set of chemically definable factors which were responsible for sex expression. In the female there occurred the element of periodicity of sex manifestations and of reproductive drives in the proper sense. There were many activities in the care of the young, but they were to some extent motivated by chemical factors belonging to the hypophyseal and ovarian mechanisms. It was possible to evoke certain partial drives and maternal behaviour in virgin rats by appropriate endocrine treatment. Cannibalism was never observed in virgin rats. Dr. Wiesner's recent work had shown that environmental factors played an equally great rôle, though at present the relation between the physiological and environmental factors was not understood.

Dr. H. GARDINER-HILL said that a study of this subject must include hermaphroditism and sex reversal, the underlying pathology of which was little understood. As a physician his thoughts tended to the endocrine aspects of the problems. Presumably the chromosomal constitution was subsequently modified by other influences, endocrine and environmental. With regard to the former of these, it was now generally accepted that the hormonic stimulus which led to the growth of the secondary sex organs and characters came from the gonads themselves. Prepubic castration in the male resulted in underdevelopment of the sex organs, prostate, seminal vesicles, absence of beard, and the retention of the treble voice, while ovariotomy in the female led to corresponding differences. Cortical tumours were associated with varying degrees of virilism in the female, and it was thought that a hormone was produced which had exerted a masculinising influence. In cases of hermaphroditism one found generative cells peculiar to both sexes, and they possessed the so-called ova-testes, and these cases usually had feminine sex characters. Another group was that having the adreno-genital syndrome. The association of lesions of the adrenal cortex with virilism was well known. The pathological lesion might be a diffuse cortical hyperplasia or an actual neoplasm. In adrenal pseudohermaphroditism there were seen to be bodily developments towards the male type, associated with the internal sex organs of the female. Gross cases of these abnormalities were rare in comparison with people who had departures in minor degrees. The view must be accepted that the development of sex characters depended on a number of factors, but the pre-existing chromosomal constitution was very important.

Sir BERNARD SPILSBURY confined his remarks to the abnormality known as masochism, the rare cases of which led to medico-legal implications when the death of the individual occurred during the performance of the act. In this condition the individual subjected himself to severe physical restraint with the object of giving himself sexual gratification. His inquiries had led him to believe that the vice was accidentally acquired in early sexual life. A difficulty from the medico-legal point of view was that the rite was usually practised in secret, and the friends and relatives had no suspicion of it; therefore in a fatal case there was no clue to go upon except the surroundings at the scene of death. For this reason suicide was a very likely verdict in these cases, or even murder. He described in detail, aided by photographs, the case of a Cambridge undergraduate who was found dead in his chambers three years ago, whose death was for some time considered to have been due to a college "rag," but was found to have been a case of masochism. In this and two others which he described the death was an asphyxial one; whether the attempted asphyxia was the stimulus to the sexual act, or whether the asphyxia was the chief accidental cause of death in these cases it was difficult to say.

The PRESIDENT said that some cases of intersexuality he had encountered caused him grave perplexity, and he had hoped that Prof. Crew would have touched on practical difficulties. It was impossible until the eighth week of fœtal life to say whether the genital organs would be male or female—i.e., whether a Müllerian duct or a Wolffian duct would develop. Seeing that all must be, at some stage, bisexual it was difficult to say, when intersexuality arose, whether a person would be a man or a woman. He had always thought it important to consider the endocrine action, the suprarenal cortex, the pituitary, and the thyroid, as well as, to some extent, the pineal gland. C. J. Bond had reported the case of a cock pheasant which was a cock on one side, a hen on the other, and it was interesting to speculate how the chromosomes got to be so beautifully divided on opposite sides of the body. He, the speaker, had had four cases of pseudohermaphroditism referred to him in one month, and he operated on all four to decide as to the kind of gonad present. In each case he found a normal ovary. In these cases the secondary sex characters were of opposite kind to the anatomical structure of the gonad. Also, in pseudohermaphroditism one always found that the secondary sex characters of the female were much more perfect than were the sex characters of the male. In this condition, too, the ovaries were always more fully developed than were the testes. He contended that the law was wrong when it declared that an individual was a male or a female according to the nature of the gonad.

Dr. LEONARD-F. BROWNE remarked that masochism showed many forms of expression, but many, fortunately, did not lead the perpetrator into risks. There was also the opposite condition, sadism, in which the individual, instead of seeking to suffer pain, wished to inflict it on others. Recently a man was sentenced to 18 months' imprisonment for thrashing a girl in a garage. On appeal, that sentence was quashed. He asked whether, in the cases of masochism described by Sir Bernard Spilsbury, there was evidence of loss of semen.

Mr. LENNOX R. BROSTER, speaking of the appearance of secondary male sex characters in the female, said these had been associated with changes in the adrenal cortex, but, so far, no one had demonstrated any change in that association. Operation had been done on 16 cases which were clinically classified by Dr. Gardiner-Hill as of this type, and in each the cells of the adrenal cortex were bright red, a condition not found in the adrenals of the normal person. A similar change was found in the anterior lobe of the pituitary, and in the interstitial cells of the testes. In seeking for an explanation, many fœtal adrenals were

examined, and it was found that in all the males there was a marked eosinophil reaction between the 9th and 20th weeks; in the female this was present between the 10th and 15th week, but not so marked as in the male. The appearance of the eosinophil cell seemed to be associated with male characters. He thought it could be argued that there was a prolonged male phase in the female fœtus, and at an early stage that phase might be able to convert that fœtus into an undeveloped male at birth, and that might be the explanation of many of the forms of pseudo-hermaphroditism seen. Some of these abnormal cases could be classified into psychological types, and homosexual behaviour between women might be a manifestation.

Dr. MARGUERITE LOWENFELD said that in children the desire to tie themselves up, or to tie other children up, as described by Sir Bernard Spilsbury, was common, as was the desire to subject others to pressure on the windpipe. It seemed to be implanted in the minds of certain individuals, and did not necessarily have reference to the postpubertal period. She did not remember a case in a girl. Usually it occurred in association with other factors which showed that the individual was at any rate of neurotic constitution.

Prof. CREW, in reply, pointed out that in cell division nothing was commoner than for some chromosomes to get lost. Many abnormalities were due to an irregular and unusual distribution of chromosomes carrying genes which took the forms of disease. Most of the conclusions arrived at in respect of the human subject stood in need of re-examination. He had had sent to him quite 150 cases with an enlarged clitoris and otherwise a reproductive architecture which was largely female. But inside there were found testes, uterus, broad ligament, vasa deferentia, prostate, &c. He preferred to regard such a person as a male, especially as he believed there was no ovarian tissue there.

Sir BERNARD SPILSBURY said that he did not remember a fatality due to masochism occurring in a female. In reply to Dr. Browne, there was no evidence of ejaculation of semen in any of the cases he had quoted; but in the third case the individual evidently expected to have such an ejaculation as he was found wearing a condom. The others died before the expected conclusion had had time to materialise. He was interested to hear that this tying up practice occurred in the prepuberty stage in some; after puberty this kind of practice took on a sexual significance.

REVIEWS AND NOTICES OF BOOKS

X Ray and Radium Injuries

Prevention and Treatment. By HECTOR A. COLWELL, M.D., Ph.D., M.R.C.P., D.P.H., and SIDNEY RUSS, C.B.E., D.Sc., F.Inst.P. The Barnato Joel Laboratories, Middlesex Hospital. London: Humphrey Milford, Oxford University Press. 1934. Pp. 212. 14*s*.

THIS is a clearly written account of the various injuries which may result from therapeutic radiation carelessly administered or from the exposure to X rays or radio-active substances which cannot be entirely avoided by workers in this field. The book is arranged in a series of chapters, each of which deals with effects on one of the systems of the body, and this methodical attack on the subject gives a very complete picture. Experimental work of importance is briefly described with an eye to essentials, and the type of injury caused by excessive exposure, together with the reactions which may be expected in different tissues, are discussed. The skin is the subject of the first chapter, because it is so frequently, and sometimes so disastrously, injured, and also because the reactions observed in the skin have formed the basis for dosage in practically all X ray and radium therapy. Although the authors hope that X ray cancer in radiologists will become so rare as to have only historical interest, a most interesting description of the development of the neoplasm is given; they believe that once it is established treatment, to be successful, must be drastic. They advise a wide removal of the local growth, followed, if a histological diagnosis of cancer be made, by excision of the supratrochlear and axillary glands, with the lymphatic trunks between.

The section on the circulatory system is of particular interest for the clear account of the recent work by Yoffey and others on the function of the lymphocyte and its relation to the hæmopoietic organs. While admitting that this work is still controversial, the authors find it very suggestive, particularly when considered in the light of the tissue culture experiments of Maximow and his school, who showed that lymphoid tissue grown outside the body could give rise to typical myeloid elements. They believe that if the idea that the lymphocyte is a forerunner of the red blood corpuscle is accepted, it may prove to be the explanation of certain important radiation effects, and that a new and possibly fruitful field is open for investigation.

The effects of radiation on the generative organs are also described at length. These are of great scientific importance, because it was as a result of observations on the testes and ovaries that Regaud and his co-workers demonstrated the variations in radio-sensitivity which form the basis of his theory of selective action, and of a definite time factor. Their clinical importance is equally great. Radiation is now an accepted method of treatment for carcinoma of the uterine cervix, and for many cases of myoma of the uterus and menorrhagia, so that we must know what effect this radiation will have on the reproductive system of the woman, on the ova in the radiated ovary, and on the fœtus in cases of pregnancy. The authors conclude that radiation during pregnancy is unjustifiable, except in the presence of malignant growth, in which case the fœtus must be sacrificed. As regards the result of therapeutic radiation of the ovary they are more cautious; they agree with Murphy that it cannot be definitely stated that preconception radiation has a deleterious effect on the offspring, but consider that this verdict of "not proven" should not be made the excuse for indiscriminate radiation of the ovaries of young women for conditions which can be otherwise treated.

From the clinical point of view nothing is more important than the description of the reactions and sequelæ which may follow the therapeutic use of radium. This section of the book is of special interest in view of Dr. Coutard's warning in our last issue. The authors remind us that late complications may appear at any time from six months to three years after treatment, and that these late radium reactions may so simulate recurrence of the malignant disease that only careful histological examination of the

tissues can determine the diagnosis. They also point out the difficulty of avoiding radium necrosis of bone when treating certain lesions, particularly in the superior maxilla, and they accept Regaud's suggestion that this special susceptibility is due to the mineral salts in the bone producing secondary radiations. They consider that more careful dosage and increasing the time during which the radium is allowed to act should minimise these injuries.

The last two chapters deal with poisoning by radio-active substances and "X ray and radium quackery." In few words they paint an unforgetable picture of the terrible results which followed the ingestion of radium by girl workers in the famous New Jersey dial painters case, and also in several cases where radio-active water had been taken for therapeutic purposes. No doubt remains that poisoning by radio-active substances produces painful and fatal diseases, and readers will agree with the conclusion that legislation to schedule these substances as poisons is already overdue. An appendix gives us the recommendations of the X Ray and Radium Protection Committee, and a clear account of the methods of dosage at present in use.

There is an excellent bibliography, which completes a work of reference which should be studied not only by every radiologist, but by every practitioner who employs either radium or X ray in the treatment of his patients.

Management of Fractures, Dislocations, and Sprains

By JOHN ALBERT KEY, B.S., M.D., Clinical Professor of Orthopædic Surgery, Washington University; and H. EARLE CONWELL, Orthopædic Surgeon for the Tennessee Coal, Iron, and Railroad Company. London: Henry Kimpton. 1934. Pp. 1164. 63*s*.

THIS book on fractures deserves similar welcome from students, general practitioners, and surgeons. It is a complete account of modern ideas and methods, and in spite of bulk, contains no obvious redundancy; each injury is treated from every aspect, but nothing is included that has not practical value.

The introductory chapters give a short account of modern views on the repair of fractures, setting side by side the osteoblastic theory of bone-formation, in which the bone cell is considered the determining factor, and the theory which regards osteogenesis as a function of de-differentiated mesoblastic tissues occurring in the presence of an excess of calcium. In a short discussion of X rays in the treatment of fractures the authors express the view that it should be possible to diagnose and treat many fractures without radiography: protesting against the pressure put on doctors to obtain X rays of every case of suspected bone injury. There are descriptions of plaster-of-Paris technique, of extension methods, of open operation, and of the method of local anæsthesia for reduction of fractures. The chapter on compound fractures will be found a useful guide to the indications for débridement, primary suture, and inaction alone. This chapter is a good example of the method used throughout the book of teaching principles and encouraging thinking.

In the sections dealing with individual fractures the descriptions and illustrations are informing. Where two or more methods are considered by the authors to be of proved value details are given of each, and no method is mentioned that is not described. Little fault, we imagine, will be found with the selections of treatment, though some will regret that Robert Jones's flexion method in the treatment of fractures round the elbow should be condemned with what is, perhaps, rather a lack of understanding of his original description. The Sinclair glue extension is dismissed in words that suggest the details of its application have not been mastered. Special writers have dealt with fractures of the skull and of the face. The chapter on fractures of the skull and brain trauma, contributed by Dr. Charles E. Dowman shortly before his death, is an admirably clear exposition of a difficult subject. One correction seems to be called for. On p. 513, in a description of the method of reducing a supracondylar fracture of the humerus, it is rightly advised that the final manœuvres should take place with forearm in the pronated or partly pronated position, to obviate the danger of inward angulation of the lower fragment. A reference is given to a photograph on the next page which shows the manipulation being performed with the forearm held in very full *supination*. We do not agree with the suggestion here made that "perhaps the majority of men who treat fractures have relatively little interest in these lesions and expend as little labour and time on their fracture cases as possible." Anyhow, those who do regard such cases as uninteresting will find in this volume much to stimulate them to reconsider the attitude.

Formes chirurgicales de la tuberculose intestinale

By L. BÉRARD and M. PATEL. Paris: Masson et Cie. Pp. 264. Fr.50.

THERE are but a limited number of general surgeons who can claim to have a considerable experience of intestinal tuberculosis. For others this monograph is invaluable, since it gives an account of the various tuberculous lesions met with in the intestine for which surgery is indicated. Not only is the pathology of the several conditions well described, but the means of diagnosis, the indications for surgical intervention, the correct choice of procedures, and the probable outcome are so clearly expounded, as very largely to compensate for small clinical experience. On these grounds the book can be warmly recommended. It is completed by a really good bibliography.

Aids to Neurology

By E. A. BLAKE PRITCHARD, M.D., M.R.C.P., Assistant Physician, Hospital for Epilepsy and Paralysis, Maida Vale. London: Baillière, Tindall and Cox. 1934. Pp. 376. 5*s*.

BY the use of small yet clear type and thin yet opaque paper, the author of this latest addition to the Students' Aid Series has contrived to compress much knowledge into little space. The book slips into the pocket easily, and since it is intended for students "in the early years of their medical training" the facts are presented in as simple a manner as possible, without discussion of theories and with a minimum of anatomical detail. On the physiological side more is said, and this is to be recommended, for after all the study of symptoms is the study of functions. A general introduction on semeiology is followed by descriptions of syndromes and symptoms resulting from disease of the principal divisions of the nervous system—peripheral nerves, spinal cord, brain, and autonomic system respectively. In each of these sections the main morbid states likely to be seen by the student are examined seriatim, their causes specified,

their pathology sketched, their symptoms reviewed. Diagnosis and treatment are also discussed. It is good to find how adequate is the presentment in most instances, notwithstanding its enforced brevity; Dr. Pritchard shows his skill in knowing what to omit as well as what to include. At times, however, he is too brief; there are quite a number of other causes for subarachnoid hæmorrhage than aneurysmal rupture; in so-called neuromyelitis optica other paraplegic syndromes than that of "acute transverse myelitis" are possible; other pathological bases for progressive muscular atrophy of syphilitic origin than meningomyelitis exist. The conception of "end-arteries" in the brain (p. 179) needs revision. "Serous meningitis" is a better term than "otitic hydrocephalus," with which it is here made synonymous, for the former is more comprehensive than the latter.

Outline of the Cranial Nerves

By JOHN FAVILL, M.D., Associate Clinical Professor of Neurology, Rush Medical College. London: Cambridge University Press. Pp. 112. 8*s*. 6*d*.

IT is not easy to write a compendium of cranial nerve anatomy and physiology in small compass. The subject is intricate; tests are sometimes elaborate and cannot be made less so; some matters are still sub judice; while in regard to others conflicting views obtain. Dr. Favill's little book is so good that it is worth while pointing out one or two things that should be reconsidered in a future edition. Under the list of conditions associated at times with optic atrophy reference should also be given to oxycephaly, Friedreich's disease, amaurotic family idiocy. It is surely a mistake to put down Mongolian idiocy as a cause of optic neuritis, or Friedreich's disease as a cause of retrobulbar neuritis. The worth of Wernicke's reaction (pupillary) has been challenged more than once successfully. Under the pathology of the oculomotor nerve mention of recurrent types and their causation might be made. Ingvar's explanation of the Argyll Robertson pupil is not, we consider, the "best," since it does not explain its occurrence in tumours of the anterior colliculi. Anisocoria may also occur in lesions of the temporal lobe and this deserves note. The difference between the respective actions of atropine and cocaine on the pupil is not made altogether clear. Myasthenia should be added to the list of causes of transient diplopia. The "jelly" nystagmus of disseminated sclerosis is worth specifying. Syringomyelia is also a cause of nystagmus. Deep sensibility from ocular muscles is not conveyed by the fifth.

Despite these and other minor matters we congratulate the author on his admirable little volume, which serves a most useful and practical purpose.

Recent Advances in Pathology

Second edition. By GEOFFREY HADFIELD, M.D., F.R.C.P. Lond., Professor of Pathology in the University of Bristol; and LAWRENCE P. GARROD, M.A., M.D., B.Ch. Camb., M.R.C.P. Lond., Bacteriologist and Lecturer in Bacteriology, St. Bartholomew's Hospital. London: J. and A. Churchill. 1934. Pp. 457. 15*s*.

IN the second edition of this excellent book the text has been revised and a few additions have been made. These, while not adding greatly to the bulk of the book, considerably enhance its value. In particular attention may be drawn to a section on the pituitary gland which shows clearly the general trend of recent work on this subject. The section on the digestive system includes a discussion of the different forms of anæmia; this is just[ified] by the accumulation of evidence that certain forms of anæmia are fundamentally disorders of gastro-intestinal function. Recent observations incriminating radium as a carcinogenic agent are described in the chapter on experimental cancer research. The section on vitamins has been rewritten and brought up to date. In the neurological section a few errors are perpetuated, for example the statement that capillary hæmangioblastomas are confined to the cerebellum, and the treatment of the very difficult subject of the gliomas leaves something to be desired. In such a matter it is obvious that all exponents cannot be satisfied, but the authors have hardly recognised the large measure of agreement that exists on such aspects as are essential for teaching purposes.

The work as a whole is well up to date and provides a most useful adjunct to the ordinary text-book on pathology.

La sténose hypertrophique du pylore chez le nourisson

By J. POUCEL, Surgeon to the Hospitals of Marseilles. Paris: Masson et Cie. 1934. Pp. 108. Fr.20.

THIS well-planned monograph on hypertrophic stenosis is a valuable contribution to the surgery of infancy. The section on ætiology and pathology of a little understood condition is well set out. Dr. Poucel, while not stressing any particular theory, inclines towards that of a sympathetic nervous system anomaly. The clinical aspect is fully described, with a vivid and accurate description of the appearances of acute starvation so often seen in pyloric stenosis. In discussing the investigation of a suspected case the importance of the blood chemistry is perhaps unduly stressed, and similarly one would hesitate to assert that every case should undergo X ray examination. In discussing the differential diagnosis between pylorospasm and true stenosis the author notes that the former condition will yield in the majority of cases to treatment by calcium chloride, belladonna, lavage, and ultra-violet ray treatment, and he wisely asserts that cases of so-called spontaneous cure are usually cases of spasm—a belief supported by those of wide experience. In the section on treatment, the importance of collaboration between physician and surgeon is well emphasised, and all will agree with the author's insistence on breast feeding where possible throughout the treatment, whether medical or surgical. It is also satisfactory to find that early operation, as soon as diagnosis is established, is strongly advocated, since only in this way can a low mortality be achieved. In the section on operative technique Dr. Poucel points out that the operation, usually associated with the name of Rammstedt, was actually first described and practised by Fredet. Nowadays, when local anæsthesia is extensively used for this operation, it seems strange to see chloroform advocated as the anæsthetic of choice, especially as the subject is not uncommonly in a toxic condition, due to starvation and gastric fermentation.

The monograph is carefully and accurately written and should certainly be studied by both the pædiatrician and the surgeon interested in children's disorders.

THE LANCET

LONDON: SATURDAY, JULY 14, 1934

MODERN PHYSIOLOGY

In the more stabilised sciences certain guiding principles have long been established, and the navigator on the ocean of research is able periodically to check his position with the sextant; in physiology he sails largely by "dead reckoning," and his course is only taken as correct when other explorers have charted the same seas by similar methods and confirmed it. Few have sailed so widely as Prof. Barcroft, and his experience enables him in his newest work[1] to survey the details of such voyages as appear to him to indicate the existence of certain landmarks.

He takes first the dictum of Claude Bernard: "La fixité du milieu interne est la condition de la vie libre." Characteristically, the question is emphasised—how does the increasingly delicate control of higher animals over their internal environment help them towards a freer life? The principle of storage is then introduced; it rests on the thesis that an intermittent external supply cannot be translated into internal constancy unless depôts are laid down to be drawn upon when required. In spite of mechanisms calculated to keep constant the "milieu interne," and notwithstanding the existence of stores, there is a limit to which any single system can respond to a change in activity of the organism. For instance, although the tissues do not use all the available oxygen in the blood while at rest, during muscular activity the spare oxygen would be insufficient in itself to meet the situation; a greater number of capillaries must be opened, the output of the heart increased, the respiratory movements augmented, and so on. This introduces the principle of integration; in the author's own words: "Every adaptation is an integration." In contrast to this is the principle of antagonism; constancy of an entity such as muscle tone does not indicate inertia, but rather the balance of opposing forces such as excitation and inhibition; this makes for rapid and efficient adjustment. The latter may be achieved by "heightening the efforts of units already functioning or by marshalling a greater number of units," and so we have a discussion on "units" and the "all-or-none relation." A matter bound up with delicacy of response is the possible existence of a crude mechanism which has been overlaid, but not entirely supplanted, by a more refined one, and the principle of duplication of mechanism is suggested. Then how are we to measure the activity of a tissue? To take as a standard its resting activity is to adopt a notoriously unreliable criterion. Prof. Barcroft suggests that its maximal capacity for effort is much more constant, and works out the principle of maximal activity. Briefly, we are asked to look at physiology from a new angle, and to regard it as a science based on certain characteristic principles.

The critical reader will realise that all these ideas are not new, and that others may turn out to be fallacious; he may even think that some have been omitted. The last thing one would suppose from the tone of the work, however, is that the author claims finality. It is an adventure, and the approach he has opened up will doubtless be exploited by others until by elimination a few fundamental principles are accepted. It is, moreover, a personal adventure. Running right through is the thread of the author's own experience; no attempt is made at exhaustive treatment of any subject in the modern review sense of considering every piece of work which has been done. The core of each chapter is an idea, and an arbitrary selection of evidence is made just sufficient to render this clear; it is not surprising, therefore, that the work of the Cambridge school bulks large in the arguments advanced. These are closely reasoned, often ingenious, and call upon the powers of concentration of the reader; as is to be expected, they may nearly all be applied to investigations not mentioned by the author and which must be supplied by the reader himself if he is to obtain full value from the exposition. The treatment is never heavy, and is relieved by frequent outcrops of humour and reminiscence. Intense individuality is the keynote of the style, and in places accounts for the material itself; if Prof. Barcroft feels like writing a great deal about a single point he does so. Ten times the amount of space allotted to the kidneys is devoted to the lungs in considering the regulation of H-ion concentration, but a fascinating theory of respiration is evolved. It would not be difficult to pick out points for criticism—as for example, the treatment of Head's theory of sensation—but the whole value of the work, apart from the account of certain original investigations, is in its stimulus to thought, and criticism not directed at the main thesis is hardly valid. Although it is probably true to say that no one could read this work without acquiring new information, it should be studied by everyone interested in the evolution of physiology not for this reason, but for the sake of its orientation.

[1] Features in the Architecture of Physiological Function. By Joseph Barcroft, C.B.E., M.A., F.R.S., Fellow of King's College, Cambridge; Hon. M.D., Louvain; D.Sc., Queen's and National Universities of Ireland. London: Cambridge University Press. 1934. Pp. 368. 20s.

MAGNESIUM SALTS IN NEPHRITIS

The therapeutic value of Epsom salts in nephritis was well known to the older clinicians, who used it in dropsy to remove fluid from the body. A few years ago K. D. Blackfan[1] recommended the administration of magnesium sulphate in cases of acute glomerular nephritis in children as a means of warding off the cerebral manifestations usually described as uræmic convulsions, which he regards as due to cerebral œdema. Very large doses were found to be necessary: at first 30 to 60 c.cm. of a

[1] Bull. Johns Hopkins Hosp., 1926, xxxix., 69; Jour. Amer. Med. Assoc., 1931, xcvii., 1052.

50 per cent. solution was given by the mouth or per rectum and repeated every four hours; later it was observed that a more rapid effect could be produced by the intravenous injection of a 1 per cent. solution of the anhydrous salts in doses of 10 c.cm. per kg. of body-weight or by the intramuscular injection of a 25 per cent. solution of the salt in doses of 0·2 to 0·4 c.cm. per kg. In a recent paper, however, A. D. HIRSCHFELDER [2] points out that the use of magnesium sulphate in nephritis is not without danger, especially if it is given by the mouth when the increase in the magnesium content of the plasma cannot be controlled. In a normal organism the administration of magnesium sulphate is followed by rapid excretion of the ingested salt through the kidneys and the plasma magnesium shows only a slight rise, the maximum increase being 0·4 mg. per 100 c.cm. of plasma. But in conditions of impaired renal efficiency, whether induced experimentally in animals or present in man, the excretion of magnesium salts is greatly delayed, and the administration of Epsom salts per os therefore leads to a tremendous and rapid rise in the plasma magnesium. In animals with experimentally induced renal insufficiency this may be sufficient to raise the level from the normal of 2 mg. per 100 c.cm. of plasma to the neighbourhood of 17 mg., when coma sets in. In nephritic patients an ordinary purgative dose of Epsom salts may raise the magnesium content to 10 mg. or even higher, and a number of patients showed a decidedly increased drowsiness or even a light coma accompanying the increase in plasma magnesium. It is pointed out that a condition easily mistaken for uræmic coma can be induced sometimes in nephritic patients by Epsom salts purgation.

When the magnesium content of the plasma was determined in patients with acute, subacute, and chronic glomerulonephritis before and after the administration of Epsom salts, it was found that there were two distinct groups: those with an abnormally high and those with an abnormally low magnesium content. The majority of the patients (nine cases) showed a slightly higher level—3 to 5 mg. of magnesium in 100 c.cm. of plasma—but in three the increase in the magnesium content was considerable (from 9 to 13 mg.). In such cases therefore the use of sodium sulphate as a purgative is preferable to Epsom salts. In a smaller group of four patients the magnesium content of the plasma was reduced to half the normal level, and there were general muscular twitchings. These were abolished by a purgative dose of Epsom salts which also raised the magnesium level considerably, but not to the same high figures as in the patients with a high plasma magnesium. A low plasma magnesium associated with general muscular twitchings was observed also in six patients suffering from other conditions such as parathyroid deficiency, eclampsia, and epilepsy. In these patients also the muscular twitchings were abolished by a purgative dose of Epsom salts. It will be seen therefore that there is a clinical syndrome of high plasma magnesium accompanied by drowsiness or coma and another one of low plasma magnesium accompanied by muscular twitchings or convulsions.

The observation that nephritis in man may be associated with an abnormally high or an abnormally low magnesium content of the plasma gains additional interest from the fact discovered by W. CRAMER [3] that it is possible to produce experimentally an extensive glomerulonephritis by a diet deficient in magnesium salts. This effect is due to an imbalance between calcium and magnesium ions, known to be biological antagonists, since the nephritis fails to appear if both magnesium and calcium salts are omitted from the diet. This suggests that the Ca : Mg. ratio in the plasma is of more importance for the maintenance of renal efficiency than the absolute amounts of either magnesium alone or calcium alone and that investigations along these lines may throw fresh light on the problem of nephritis.

[2] Jour. Amer. Med. Assoc., 1934, cii., 1138.

THE LONDON CHILD

To ratepayers who have watched a little wryly the progressive policy of the London County Council with regard to public health, Sir FREDERICK MENZIES's latest report [4] as school medical officer should prove particularly reassuring. The direction of the energies of the school medical service toward the prevention and control not only of disease but of the factors tending to defective physical development should do much to reconcile those whose money is spent "by somebody else for somebody else."

The eldest groups of children with whom the report is concerned are a product of the post-war years, the "leaving" class having been born in 1919 and 1920, at a time when large numbers of able-bodied men had been demobilised and the birth-rate was rising rapidly. Their superior physique as compared with the children born a little earlier is perhaps attributable not only to better nurture but also to the fact that a considerable proportion of wartime babies belonged to fathers physically unfit for military service. While it is hard to say whether there is actually an increase in stature in the present as compared with earlier generations, a comparison of the average figures for height and weight, obtained by Dr. R. H. SIMPSON in his survey of the 10-year-old group of boys and girls in 1933, seems to show a significant gain over corresponding figures for the whole of London between 1902 and 1907. Similarly a comparison of the average height of recent secondary school boys between the ages of 14 and 15½ with Roberts's tables (compiled about 50 years ago from artisans, public school boys, and cadets) show an increase of about 1 inch at each age. In the Council's residential schools and homes a new standard (provisional) dietary came into force in March, 1932, and Dr. W. P. SHELDON has compared the weights and heights of children at the time

[3] THE LANCET, 1932, ii., 174; Proc. Roy. Soc. Med. (discussion on nephritis), 1934, xxvii., 801.

[4] London County Council, Annual Report of the Council, 1933, vol. iii. (Part II.), Report of the School Medical Officer for the Year 1933. By Sir Frederick Menzies, K.B.E., F.R.C.P., County Medical Officer of Health and School Medical Officer. Copies obtainable from P. S. King and Son, Ltd., 14, Great Smith-street, London, S.W.1. 6d.

the new dietary was introduced with the weights and heights of children of the same age who have had it for a year. In 10 out of 13 age-groups the advantage in both weight and height lies with the children on the new dietary, and it is found that the actual average increases in each age-group considerably exceed the expected increase as calculated from the average weights of London elementary school-children of different ages. The improved dietary is given in detail in the report. In the ordinary school the continued high incidence of unemployment and economic depression has made the provision of "meals" (dinners with 25 g. of protein and 750 calories, milk, and cod-liver oil and malt) increasingly necessary. The school care committee is required to "place upon the feeding list every necessitous case requiring additional nourishment in order to profit by the education provided," and 4½ million meals, of which nearly 2 million were paid for out of the rates, were provided in 1932–33. One is inevitably reminded of the savage description of the modern world—

> "Science finds out ingenious ways to kill
> Strong men, and keep alive the weak and ill
> That these a sickly progeny may breed
> Too poor to tax, too numerous to feed"

and can only hope that the future will justify the attempts now being made to keep the standard of living for all children at a level that makes healthy growth and development possible.

The rôle of the physically defective schools could usefully be studied by most medical men who are unfamiliar with their organisation. Dr. GERALD SLOT has carried out an inquiry into the causes of absence from these schools, and finds that children are often excluded by medical certificate because of the very diseases that the schools are designed to treat. Usually more rest and warmth can be had at these schools than at home, and not infrequently the medical certificate simply provides facilities for playing in the street or helping with the housework. Additional reasons for non-attendance include missing the ambulance (which may not be able to enter the alley in which the child lives, and must be awaited at "points" in the street), subconscious malingering, and over-anxiety on the part of parents; whilst genuine illness, requiring hospital or convalescent treatment, is of course commoner than in normal children. The work nowadays called child guidance is not directly undertaken by the Council as an education authority, but a clinic is available through the mental hospitals service at the Maudesley Hospital where psychotherapy is available for school-children and others. Here, and at other centres, including the London Child Guidance Clinic and the East London Clinic, the attendances are allowed to be counted as attendances at school. Except at the Maudsley, however, the provision of child guidance is by voluntary hospitals and associations. Open-air education is provided for tuberculous cases in six open-air day schools, accommodating a total of 568 children, and there are nine such schools for non-tuberculous children (1627). In addition there are seven convalescent camp schools and 209 open-air classes in playgrounds and parks. Despite the difficulties of the London climate, there is no question that these schools are filling a real need and are extremely successful with selected cases, especially those of chronic lung infection.

The report as a whole gives evidence of activity and expansion in almost all the fields covered, and it is impossible not to be impressed with the spirit of optimism in which it is conceived and written.

ANNOTATIONS

BRITISH EMPIRE CANCER CAMPAIGN

THE eleventh annual report of the British Empire Cancer Campaign, a substantial volume of 220 pages, contains reports from 30 institutions or individual workers who have been subsidised by the Campaign. At the annual general meeting held at the House of Lords on July 9th, Lord Reading presiding, Mr. Cecil Rowntree said that the report afforded convincing proof that the purposes for which the Campaign was founded were being fulfilled. The work carried out in the different centres differs necessarily both in its extent and in its value, and it is only intended to indicate here some of the more important advances made. A group of research workers at the Cancer Hospital, under the direction of Prof. E. L. Kennaway, some years ago isolated from tar substances having the power to induce cancer. They then proceeded to prepare synthetically a large number of chemically pure organic substances and to test their carcinogenic power. This work, to which we have repeatedly drawn attention, led to the surprising discovery that some of these carcinogenic substances were chemically closely allied to substances normally present in the cells, such as the sterols and the chemically related bile acids, which are probably formed from sterols This suggested the possibility that the cells of the body, when placed under abnormal conditions, might be able to form, as abnormal metabolites, substances which are carcinogenic. In order to test this question Mr. J. W. Cook, M.Sc., and Mr. G. A. D. Haslewood have taken as their starting point one of the bile acids and have prepared from it an actively carcinogenic substance. This transformation was effected by a series of chemical changes of exactly the same nature as those which commonly occur in the body. The chain of evidence is therefore nearing completion that carcinogenic substances can be formed by the cells in vivo. The hormone œstrin, one of the substances normally present in the body, is also chemically closely allied to the sterols and to some of the synthetic organic substances capable of inducing cancer. Investigations carried out in conjunction with Prof. E. C. Dodds have shown that some of these synthetic carcinogenic substances have also the power to induce œstrus, although in comparison with œstrin larger amounts are required. But not all carcinogenic substances can produce œstrus, and œstrin itself is not carcinogenic.

Another interesting line of investigation was initiated a few years ago by Dr. P. R. Peacock at Glasgow. He showed that it was possible to induce with comparative ease sarcomata in fowls by the injection of tar or of pure organic carcinogenic substances. Some of these tumours could be propagated, but only by the transplantation of living cells, and not

by the inoculation of a cell-free tumour extract. This seemed to establish a difference of ætiological importance between the malignant growths which arise in fowls and mammals including man in response to chemical substances on the one hand, and on the other the group of filtrable tumours discovered by Rous which can be propagated by an "extrinsic agent" or "virus." Prof. E. Mellanby appears to have had a similar experience but the experimental details of his work have not yet been published. Prof. J. McIntosh now states that he has succeeded in producing in fowls by tar a number of sarcomata, three of which proved to be filtrable, and a similar result is reported by Dr. A. Haddow from Edinburgh. These results are a strong argument in support of the view that the filtrable fowl tumours represent true malignant neoplasms, and that they should not be set aside as an atypical form of malignancy with an entirely different ætiology. In the introductory summary to the report the conclusion is drawn from these findings that the behaviour of the filtrable fowl tumours is due to some characteristic property peculiar to fowl cells; that, however, is not the only possible explanation.

In Leeds Prof. R. B. Passey has begun a reinvestigation of the classical experiments of Fibiger on spiroptera cancer, in which the experimental production of cancer was demonstrated for the first time. Prof. Passey's work indicates that other subsidiary factors, not suspected at the time by Fibiger, play a part in the process. Dr. R. E. Havard and Dr. Sylvia Dickenson have tested the truth of the statement frequently made that the blood of patients suffering from cancer is abnormally alkaline. Using arterial blood and an exact physical method they failed to find any change. Dr. J. W. Orr has carried out experiments showing that fibrosis of the dermis facilitates carcinogenesis, presumably because it interferes with the blood-supply. The action of radium and X rays has been investigated in a number of centres, both from the experimental and from the clinical side, notably at St. Bartholomew's Hospital, the Westminster Hospital, the Mount Vernon Hospital, the Strangeways Research Laboratory, and the Christie Hospital and Holt Radium Institute in Manchester. It is noteworthy that the question of changes in the leucocyte count following irradiation, on which we commented last year, has been reinvestigated in the Manchester centre, and as a result two points are emphasised: (1) there is a lymphopenia in patients treated by radium which increases with the dose; (2) blood counts repeated at least once a month have been found of definite value in keeping a check on the health of the staff engaged in radiotherapeutic work.

The eleventh report of the Campaign is commendably free from exaggeration of the value of the results obtained, nor do these need exaggeration. The report represents a real advance both in our understanding of the ætiology and in our efforts towards the treatment of the disease, and is the best possible argument for the continued support of the work by the general public for whose benefit it is done.

RADICAL SURGERY OF THE MAXILLARY ANTRUM

In the surgical treatment of suppuration of the maxillary antrum rhinologists in this country of recent years have favoured the intranasal operation, by which an aperture is made in the antronasal wall large enough to remain open permanently and the drainage thus established is relied on to effect a cure. The Caldwell-Luc operation, which exposes the antral cavity through its anterior wall as a preliminary before making the opening into the naris, is usually reserved for the more intractable cases and for those in which a portion of tooth or of dead bone is lying in the antrum, or in which there is definite polyposis. Dr. Edward F. Ziegelman,[1] of San Francisco is now advocating the latter method, together with removal of the entire mucous membrane lining the cavity and of the anterior ethmoidal cells, also in all those cases where there is disease in the neighbourhood of the natural ostium. He strongly objects, however, to the usual transverse incision with elevation of the premaxillary soft structures from the bone, and makes an inverted T-shaped incision of which the vertical branch runs obliquely upwards and outwards parallel to the fibres of the facial muscles. Since these muscles run in the upper lip, and the incision is placed deeply to this, it is difficult to see how it can be a matter of any great importance. The most noteworthy part of his communication is concerned with anæsthesia for the operation. He prefers a local anæsthetic and considers that nerve-blocking is the ideal method. This he produces by injection through the external aspect of the face, passing a long needle into the neighbourhood of Meckel's ganglion in the spheno-maxillary fossa. The needle is inserted at a point on the inferior margin of the zygoma two-fingers' breadth external to the outer bony angle of the orbit, and directed towards the external angle of the opposite orbit to a depth of approximately 7 cm.; 3 c.cm. of 1 per cent. novocain are injected. As the injection does not always catch the main trunk in its entirety, a second injection of 2 c.cm. is made into the infra-orbital nerve at its exit from the foramen. Since the anterior ethmoidal cells often have to be opened during the operation, these are anæsthetised by a pack of 5 per cent. cocaine beneath the middle and inferior turbinals, or by injection of 1 c.cm. of the novocain solution into the region of the anterior ethmoid foramen through the skin at the inner angle of the orbit. Dr. Ziegelman mentions that the patient often objects to the insertion of the needle into the spheno-maxillary fossa by way of the external surface; such objections, which are hardly surprising, may be met by injection via the posterior palatine canal by means of a curved needle inserted through the mouth. In addition to the novocain injections, the patient is given, two hours before operation, grs. 10 of one of the barbiturate salts by the mouth, and an hour later a hypodermic injection of morphine sulphate gr. ¼ with scopolamine gr. 1/200. Probably surgeons in this country will prefer a general anæsthetic in cases where it is not definitely contra-indicated.

PUBLIC HEALTH IN THE IRISH FREE STATE

An extensive account of the activities of the Departments of Local Government and Public Health in the Irish Free State is given in the 1932–33 report of the Minister.[2] Sanitary surveys, it is reported, were carried out by the medical inspectors of the department in 37 different areas (the majority urban), and where serious defects in the sanitary administration were discovered they were brought to the notice of the local authority, special attention being paid to water-supplies and sewerage systems. Despite the constant intercourse with England and Wales the last appearance of small-pox in the country was, it is

[1] Western Journal of Surg., Obstet., and Gynæcol., February, 1934.

[2] P. No. 1154. 1934. 2s. 6d. net.

noted, as long ago as November, 1923, and no fatal case of the disease has been registered since 1907. On the other hand, 30 cases of typhus, with 8 deaths, were recorded in 1932, whereas in England and Wales there were only 9 deaths from this cause in the whole of the ten years 1923–1932. Twenty-five of the 30 cases occurred in Kerry County and 22 from three families affected in an outbreak in November. A general campaign of delousing and disinfection was instituted and no further extension took place. Notifications and mortality from diphtheria both showed in 1932 an appreciable rise over the figures of the previous year, and immunisation schemes have been organised in numerous areas. In Cork County Borough, where a prolonged epidemic has been experienced, nearly 7000 children were immunised between 1929 and 1932, and the high record of 626 cases in 1930 fell to 282 cases in 1931, and to 90 cases in 1932. The case-mortality rate, however, has not kept pace with the reduction in notifications and was as high as 19 per cent. in 1932, though, it is important to note, no immunised child died. With the decline in the incidence of the disease in Cork there was observed a marked falling off in the number of children brought to the immunisation clinic, so that the consequent increase in the number of non-immunised children may provide a new field for the extension of the disease.

An unsatisfactory feature of the registration returns for 1932 was a slight rise in the infant mortality-rate to 72 per 1000 births, chiefly attributable to an increased mortality from diarrhœa and enteritis and pneumonia. Nursing associations to attend to the health of the infant and young children, as well as of expectant and nursing mothers, are being organised, and with the help of the sweepstake surplus a number of such associations were launched during the year. Rapid development has also been made in the school medical inspection arrangements which in 1929 covered only 146,000 children and in 1932 extended to 378,000, or 75 per cent. of the elementary school population. Many of the medical officers comment upon the incidence of malnutrition, and in June, 1932, the Dáil voted £100,000 to assist local authorities to provide free milk and so ensure that during the period of economic distress children in the poorest families should not suffer from a lack of food essential to their healthy growth and nourishment. In spite of the economic position a new low record was registered for tuberculosis mortality, though the crude death-rate of 1·24 per 1000 is considerably higher than that in England and Wales. Other sections of the report are devoted to local finance and administration, to housing, public assistance, and to roads.

SILICOSIS IN THE SOUTH WALES MINER

FEW diseases require a more comprehensive survey before diagnosis than silicosis. In the June issue of the *Practitioner* Dr. A. J. Amor and Dr. R. G. Prosser Evans made a brief assessment of the various factors of this disease as it affects the South Wales coal-miner. Although they admit that W. R. Jones's recent suggestion of sericite as a causative factor needs careful consideration, they do not appear to regard the evidence as it stands at present as convincing. In dealing with the all-important matter of X ray examination, the authors stress the necessity for accurate standardisation of films, especially the exact centring of the patient, a speed of exposure which will avoid blurring, and standard developing. A pre-X ray stage of the disease is recognised in addition to the first, second, and third stages of the shadowing on the film. Details are also given of a method of chemical examination which they adopt in investigating the silicotic lung after removal from the cadaver. The lung is first X rayed with a soft tube and areas which appear to be suspicious in the film are selected for pathological examination, together with immediately adjacent areas. The portions thus removed are divided into two so that as far as possible macroscopically identical portions can be used both for section work and for estimation of silica content. Whilst recognising that this method is open to some criticism, the authors believe that it enables a fairly full and accurate description of the pathological condition to be made. Chemical determinations of silica content are considered to be of value and importance when assessed together with the other diagnostic factors; but taken alone they are, in the opinion of the authors, of little use because a high silica content may be found in lung tissue in which no gross lesion is present. Two methods of silica determination are used: (1) the modification of the colorimetric method of Isaac; and (2) the gravimetric method of Treadwell and Hall. A representative series of determinations of silica content from six areas of a lung are given in a table, showing a range from 16·32 to 28·15 per cent. in two upper lobe portions.

ORGANISATION IN THE OPERATING THEATRE

Dr. Eugene H. Pool, of New York, a surgical teacher of great experience, writing of the part played by the nurse in the organisation of the operating theatre, says "her coöperation, skill and goodwill are usually taken for granted." It is substantially true that where the work of the nursing staff is efficient its importance to the success of the operation is unrealised, or at least forgotten, by the surgeon—until her coöperation breaks down in some detail. If this detail is of sufficient importance—as, for instance, a miscount of the swabs in an abdominal operation, or a muddle over the contents of the bottles on the anæsthetic table—the surgeon is made sharply aware of the degree of responsibility he is delegating to the nursing staff. Such an incident may stimulate his interest in the manner and material of the instruction given to the theatre nurse; but, for the most part, the responsibility for such instruction is left entirely in the hands of the theatre sister, who is not necessarily appointed to her post on a definite knowledge of her powers of training those working under her. Dr. Pool's remark, which we have quoted above, occurs in a foreword to the revised edition of a book[1] by Prof. Henry C. Falk, F.A.C.S. The basis of the book is a course of lectures given to the theatre nurses of the French Hospital of New York City. The book has been brought up to date and made as comprehensive as possible. Any doctor unfamilar with the amount of detail and specialised knowledge involved in the efficient conduct of a theatre behind the scenes would do well to look through this book, which contains many suggestions for increased efficiency.

In organising the work of an operating theatre, the first essential is a clear understanding about the delegation of responsibility. On the surgeon rests the responsibility for the patient's life. It is for this reason that, during the conduct of the operation, he must receive active and willing coöperation from everyone assisting him. All his orders and requests—reasonable or unreasonable as they may appear to others—must be obeyed at once. This is a point of view which is obvious when stated, but is not always

[1] Operating Room Procedure for Nurses and Internes. London: G. P. Putnam's Sons. 1934. Pp. 413. 12*s*. 6*d*.

implicit in the attitude of the nursing staff, probably because the reason behind it is imperfectly realised. The surgeon, in his turn, delegates responsibility to the theatre sister, and it is really essential that he should be clear in his mind at all times for just what details he is making her responsible. The sterilisation of instruments, gloves, and linen is arranged by her without any sort of supervision. In most theatres the sister looks after instruments and swabs. The surgeon should be perfectly clear as to whether he is making her responsible to him for the count at the end of an operation; he should also make it clear to the sister whether she is being held responsible. There seems no doubt that the final responsibility rests with the surgeon, but it is essential that someone quick-witted and perfectly reliable, not to say honest, should be present to do the actual business of counting, and to report to him the result. The best person is probably the theatre sister because, being constantly in the theatre and having control of the probationer nurses, she can work out a simple and efficient scheme which is rigidly adhered to at every operation.

The next important cog in the wheel is the staff nurse. It would result in more efficiency and less worry if this post, in small hospitals as well as in large, could be a semi-permanent one, and if only those nurses were appointed to it who had had special training in theatre technique, and who had proved their ability. The staff nurse has to take charge in the absence of the theatre sister, and this should imply ability to deal with any type of emergency. There are two details of operating-room procedure in which nurses appear to be specially liable to fail. One is moving the patient into one of the special positions, such as the kidney position or the lithotomy position; the other is the adjustment of the operating table. Familiarity with all the mechanism and vagaries of this table should be incumbent on every member of the theatre staff. These are, or should be, matters of regular drill. The theatre sister should not only be efficient herself, but capable of calling forth efficiency in others. It is no testimony to her capabilities that the progress of an operation should be less smooth when she is away than when she is there.

CANCER OF THE BREAST

MANY records have been made of end-results in mammary cancer, but so far few satisfactory deductions can be drawn from them. For this there may be several reasons, such as the variety of treatment adopted at different clinics, the absence of definition of the stage of tumour growth at the time of treatment, and the lack of classification in homogeneous groups. Classification for prognosis in mammary cancer seems indeed a fundamental difficulty. It might be claimed that some objective uniform plan of grouping, such as Jüngling's, is likely to be accurate and suitable for statistical purposes, but any clinical classification without microscopical check is liable to err in regard to axillary involvement. A histological classification, based on the examination of small areas of malignant tissue without reference to the morbid anatomy of the tumour as a whole, is also unhelpful. Uncertainty about the variables which should be selected as the basis of statistical analysis makes it hard to compare figures from different clinics, and probably underlies the variations in survival-rates.

A study by R. B. Greenough and G. W. Taylor,[1] the fourth of a series of reports on end-results in cancer of the breast treated at the Massachusetts General Hospital, is instructive, despite the comparatively small number of cases, because it is based on a more or less uniform treatment and grading at the same centre. Their figures add a comment on various problems; they show for example the influence of age, by emphasising the relatively greater gravity of the disease in younger women, but suggest that the duration of the tumour has only a limited value in group prognosis. For the pathologist, the authors' readjustment of view with regard to histological classification and the degree of malignancy is especially interesting. To their earlier criteria of cellular architecture and cytological character they have added an additional factor, "infiltration," which they regard as a marked step in de-differentiation and thus an indication of high malignancy. But infiltration appears to be a sign not of heightened malignancy but primarily of extension into the surrounding tissues, with greater likelihood of lymphatic vessel invasion—an almost inevitable sequence in advanced cases. This in itself would account for the less hopeful outlook in cases where this "factor" is much in evidence. Axillary involvement was present at the time of operation in 11 per cent. of their Grade I. cases, in 70 per cent. of Grade II., and in 90 per cent. of Grade III., a finding which suggests that infiltration counted as a weighty factor in prognosis.

In considering the treatment of malignant mammary tumours, Greenough and Taylor again emphasise the necessity for the complete radical operation where this is possible: where the diagnosis is in doubt—and this is usually in very early cases—they find no reason to suppose that exploratory incision is prejudicial to cure, provided that facilities for histological examination and the completion of the radical operation, if indicated, are available. Prophylactic X ray therapy was employed, in addition to operation, in most of their more recent cases, and results in these support those from other centres in giving a higher proportion of five-year cures than where no irradiation was given. They hold that increase in the percentage of five-year cures, and avoidance of many of the deaths occurring within six months of operation, may be expected from greater care in estimating operability, now that palliative irradiation is available. Reduction of mortality from cancer of the breast over all cases depends, as has often been pointed out, on the readiness of the profession and the public to take a serious view of any mammary abnormality; though in this connexion it is noteworthy that the percentage operability has remained almost constant for Greenough's series of reports on cases treated since 1894.

[1] New Eng. Jour. Med., April 19th, 1934.

ACUTE PULMONARY ŒDEMA

ACUTE pulmonary œdema occurring in heart disease is in this country generally regarded as due to a sudden left ventricular failure leading to congestion and œdema in the lungs. A different view is held by S. Wassermann,[1] who considers it due to a reflex, usually initiated from the aorta or coronary artery, in the cardio-pulmonary portion of the vegetative nervous system, leading to spasm of the pulmonary capillaries. He finds that the condition can be relieved or completely suppressed by pressure on the carotid sinus, and that the attacks, which appear for the most part spontaneously, are accompanied by an increase in pulse-rate and blood pressure and by certain other symptoms which are held to be evidence of sympathetic irritation. Carotid sinus pressure is

[1] Wien. Arch. f. inn. Med., 1933, xxiv., 213.

effective in treatment, it is supposed, principally by producing a counteracting vasodilator reflex on the pulmonary capillaries. Cardiac asthma—a condition not sharply to be distinguished from pulmonary œdema—and angina pectoris we know generally to be associated with a gross pathology similar to that of pulmonary œdema, and Wassermann believes these functional disturbances also to be the result of reflexes, the difference lying in the site of action of the effector, this being the bronchi in cardiac asthma, and the coronary artery in angina. The efficacy of the usual methods of treatment for these syndromes is considered to be better explained on the basis of abnormal reflex action than by the conventional views.

RESEARCH AT THE ROYAL COLLEGE OF SURGEONS OF ENGLAND

THE impetus towards surgical research at or in connexion with the Royal College of Surgeons of England has gained force during the last year. The annual report on the museum, research laboratories, and the Buckston Browne Surgical Research Farm records many alterations and advances in organisation and even more constructive plans for the future. The additions to the museum during the year will be on view in a special room for the next three weeks, and are better visited than described. The director of research, Prof. J. Beattie, summarises the investigations actually in progress.

Sir Charles Ballance is recording by cinematography the results of sympathetic-peripheral nerve anastomosis in animals; Mr. Winsbury-White has continued his investigations into the spread of pelvic inflammation; Mr. Mortimer Woolff is attempting to produce intestinal diverticula experimentally; Lieut.-Col. E. P. Argyle has shown that the essential lesion in "roaring" horses is a peripheral neuritis in the left recurrent laryngeal nerve. A field at Downe is being put at the disposal of Dr. R. J. V. Pulvertaft who asked for accommodation for ponies and horses in order to investigate the possibility of producing a serum which would retard the growth of secondary carcinomatous deposits in man. Mr. J. H. Thompson's extracts of the anti-growth factor of parathyroid glands have been found to retard the growth of small, but not of large, tumours in mice. At Downe Dr. D. Slome and Mr. L. F. O'Shaughnessy have been working on surgical shock, Mr. G. C. Knight on the ætiology of achalasia of the cardia, and Dr. Rupert A. Willis on a structural study of teratomata. In connexion with this work over 1000 microscopical sections have been made by Mrs. Willis, and composite maps have been drawn, enabling visualisation of the distribution and relationships of the tissue components of the tumours. The conclusions reached are that the arrangement of the tissues is not wholly fortuitous, that metaplastic changes are of frequent occurrence, and that coöperation between embryologists and morbid anatomists in the minute study of teratomata should lead to important results.

The provision of extended laboratory accommodation for research in the college itself, apart from the farm laboratories at Downe, is being considered, and various schemes to this end are under discussion.

VENTRICULOGRAPHY IN DIAGNOSIS

THE reliance placed on ventriculography as a means of localising brain tumours varies considerably in the practice of different surgeons. Its value is demonstrated, however, in an analysis, by Cobb Pilcher and Hugh M. Wilson,[1] of 97 cases of verified intracranial tumours in which it was applied. The results of this analysis are arranged in three groups. A positive result is recorded when the information obtained was of "localising" or "lateralising" value. The latter term is used to denote evidence that defines the hemisphere in which the tumour is situated but not the lobe involved. A second group is labelled as "indeterminate" and the third "misleading." In the 97 cases a positive result was obtained in 79 instances, an indeterminate in 7 and a misleading in 11. Twelve of the positive results were of the lateralising variety and it is noteworthy that 10 of these were associated with tumours of the temporal lobe. This may be accounted for by the difficulty in getting complete filling of the ventricular system and hence a failure to visualise the whole of the inferior horn. These figures should impress the sceptical with the value of this test in diagnosis. Pilcher and Wilson's conclusion that ventriculography should not be relied upon as a sole means to diagnosis but used as an adjunct to this end is in the best tradition of medical practice.

[1] Surg., Gyn., and Obst., June, 1934, p. 995.

INTERNATIONAL CONGRESS OF GASTRO-ENTEROLOGY

MANY of the clinical and pathological questions arising out of the diagnosis and treatment of the conditions covered by the term Gastro-Enterology have been gone into before medical séances and congresses, but now an international convention has been planned, to be held in Brussels in the first week of August next year, at which time a universal exhibition will be in progress in the city. Dr. J. Schoemaker will be the president, and a strong local committee has been formed. A division of the subject into sections has been arranged, the coöperation being already secured of leading men in various countries. Those who desire to participate in the debates or to be present at the meeting are asked to communicate with the secretary-general of the Congress, Dr. G. Brohée, 64, Rue de la Concorde, Brussels.

THE SURGERY OF THE ŒSOPHAGUS

A REMARKABLE communication by T. Ohsawa[1] records numerous experiments on animals and operations on man. In one respect his teaching is heterodox: he refuses to employ positive-pressure anæsthesia. Elsewhere it is based on established principles, but the results are unusually good. Though no success was obtained in tumours of the upper reaches of the œsophagus, the successes claimed for those situated below the lung root—some of these invaded the cardiac end of the stomach—are very striking. Healing was secured in 10 out of 19 cases of this type, and in these patients natural swallowing was restored either by end-to-end anastomosis of the œsophagus or by œsophagoenterostomy. To these achievements three factors appear to have contributed: first, Ohsawa recognises that the blood-supply of the lower œsophagus is largely derived from the bronchial arteries, so that a very limited resection is less likely to succeed than one that extends almost up to the level of the bifurcation of the trachea; secondly, he makes use of the large omental graft[2]; and thirdly, he employs free exposure—opening both abdomen and left pleural cavity in all the operations. Sometimes he begins with a left thoracotomy and then enters the abdomen by incision of the diaphragm; in other cases laparotomy is first performed and after section of the costal arch (in the manner of Marwedel) access is gained to the left pleura by incision of the

[1] Arch. f. Jap. Chir., 1933, x., 605.

[2] The value of this graft as a means of controlling post-operative infection in the chest was discussed by Mr. L. O'Shaughnessy in a Hunterian lecture for 1933.

diaphragm from below. In one case of innocent tumour of the œsophagus (myoma) operation was performed with success by the transdiaphragmatic route. A similar method is adopted in the operation of total gastrectomy, and he records 12 successful interventions of this type. In a resistant case of simple œsophageal stricture an antethoracic œsophagoplasty was successfully carried out, but most cases responded to dilatation. Many patients suffering from cardiospasm were treated either by œsophagogastrostomy or by the usual plastic operation at the cardia.

It is clear that, brilliant as is this record, the difficulties of œsophageal surgery are not yet overcome; nevertheless Ohsawa's work is in itself enough to justify further clinical and experimental research. It is significant that the results of operations on the dog were far inferior to those obtained in man—the difficulties of nursing and the recognition of post-operative complications are very great in animal surgery. But it was only the application of the knowledge gained in these experiments that enabled him to do the valuable work he now describes.

MEDICINE AND POLITICS

THE medical school, with its long and continuous tradition, is much older than anything else in education, said Dr. Walter Elliot, Minister of Agriculture, in his address to London Hospital students last Tuesday. Other branches of education are subject to inroads by every form of crank: in the words of Shaw, "He who can, does; he who cannot, teaches." But this is not true of medicine, where the great masters are also great teachers and the student learns not so much from what a man says as from what he does. In politics to-day, he continued, we are looking towards men of education, and the biological training of the medical student is not less valuable than the classical training of the past. Indeed in present circumstances it may be still more valuable: for the Age of Reason is past, and the Age of Unreason is upon us; the Age of Logic is defeated and the Age of Race Consciousness is victorious. "You will have to grapple," he said, "with that new heresy"—with the "pushing of biological catchwords to the verge of insanity" which is wrecking countries to-day. And as trained men confronted with these opinions and situations the former medical student should remember the long international tradition behind him. "The Oath of Hippocrates is an oath of sanity."

A MEMORANDUM has been issued from the Ministry of Health furnishing information as to measures which should be taken for collecting rain-water for domestic purposes. During many past weeks no procedures for the collect on and storage of rain-water would have had any result, but it is timely of the Ministry to remind the public that, when the rain does come, all possible pains should be taken to preserve every drop for future distribution. The memorandum points to the neglect prevalent in the collection of rain-water on roof areas, as proved by the wise employment of this supply in many districts, notably in East Anglia, where the inhabitants have for generations depended on rain collected from their roofs for drinking and culinary purposes. This, of course, is only possible where there is little or no industrial pollution. Precise instructions are given by the Ministry as to the storage capacity required and as to price and construction of receptacles. The memorandum can be obtained for 1*d.* from any bookseller.

THE SERVICES

ROYAL NAVAL MEDICAL SERVICE

Surg. Vice-Admiral Sir Reginald St. G. S. Bond is placed on retd. list.

Surg. Rear-Admiral R. W. B. Hall is granted the rank of Surg. Vice-Admiral.

Surg. Capts. T. B. Shaw and N. S. Meiklejohn to be Surg. Rear-Admirals and are placed on the retd. list.

Surg. Capt. B. P. Pick to be Surg. Rear-Admiral.

Surg. Comdr. to Surg. Capt.: K. H. Hole, J. G. Danson, J. P. Shorten, H. M. Whelan, and R. F. P. Cory.

Surg. Lt.-Comdr. M. B. Devane to be Surg. Comdr.

B. S. Lewis to be Surg. Lt.

The following appointments have been notified: Surg. Capt. E. MacEwan to *Drake* for R.N.B., Devonport. Surg. Comdrs. M. B. Devane to *Renown*; R. Buddle to *Pembroke* for R.N.B., Chatham; W. A. Jolliffe to *Victory* for R.N.B.; and A. C. V. Green to *Dolphin*.

ROYAL NAVAL VOLUNTEER RESERVE

Surg. Comdr. A. G. L. Reade is placed on the retd. list with rank of Surg. Capt.

Surg. Lt.-Comdrs. G. A. Clark and C. C. Elliott to be Surg. Comdrs.

ROYAL ARMY MEDICAL CORPS

To be Bt.-Cols.: Lt.-Cols. W. B. Purdon and F. Casement.

To be Bt. Lt.-Cols.: Majs. J. G. Gill and W. H. Hartgill.

Maj. E. P. Allman Smith to be Lt.-Col.

Maj. E. C. Stoney, Reg. Army Res. of Off., relinquishes his appt. under Art. 520 (*b*), Royal Warrant for Pay and Promotion, 1931.

Lt. T. McG. McNie to be Capt.

Maj. (Temp. Commn.) E. K. Campbell relinquishes his commn. and retains the rank of Maj.

Lt. (on prob.) R. S. Vine is secd.

CAVALRY—LIFE GUARDS

Surg. Lt.-Col. E. J. H. Luxmoore, having attained the age for retirement, is placed on retd. pay.

Lt.-Col. E. A. Strachan, from R.A.M.C., to be Surg. Lt.-Col.

ARMY DENTAL CORPS

R. H. Green to be Lt. (on prob.).

TERRITORIAL ARMY

Capt. J. C. Andrews resigns his commn.

Lt. M. C. Hounsfield resigns his commn.

Lts. D. M. Dunlop, A. S. Henderson, I. G. W. Hill, J. A. Matheson, and F. H. Taylor to be Capts.

A. C. Armstrong, D. Campbell, and J. T. Watkins to be Lts.

ROYAL AIR FORCE

The undermentioned promotions are made: Wing Comdrs. to be Group Capts.: F. C. Cowtan, W. A. S. Duck, and A. E. Panter.

Squadron Leaders to be Wing Comdrs.: J. T. T. Forbes, J. Kyle, A. F. Rook, E. A. Lumley, W. G. L. Wambeek, and T. C. St. C. Morton.

Flight-Lt. (Hon. Squadron Leader) to be Hon. Wing Comdr.: J. Valerie.

MENTIONED IN DESPATCHES

For distinguished services in connexion with the operations against the Upper Mohmands, July-October last year, the names of Col. E. W. C. Bradfield, I.M.S., Asst.-Director of Medical Servies, Peshawar District, and of Maj. F. R. H. Mollan, R.A.M.C., and Maj. A. E. Richmond, R.A.M.C., have been brought to the notice of the Commander-in-Chief in India, H. E. Field-Marshal Sir Philip Chetwode.

COLONIAL MEDICAL SERVICE

Dr. E. M. Astwood has been appointed Medical Superintendent to King Edward VII. Hospital, Bermuda, and Dr. C. J. Fournier, Medical Officer, Bermuda. Dr. W. Hughes has been appointed Medical Officer in the Federated Malay States. Dr. J. C. J. Callanan has been promoted Senior Medical Officer, Kenya, and Dr. A. T. Kuriyan, Provincial Surgeon, Ceylon.

PROGNOSIS

A Series of Signed Articles contributed by invitation

X.—PROGNOSIS OF RAYNAUD'S DISEASE

SINCE it is impossible to foretell the fate of any patient until his disease has been identified, the problems of diagnosis should have no place in an article devoted to prognosis. When dealing with Raynaud's disease, however, it is necessary to refer to two circulatory disorders which, while mimicking its manifestations run a very different clinical course.

DIFFERENTIAL DIAGNOSIS

The first is the complaint commonly referred to as "dead fingers," in which some or all of the digits when exposed to a cold and damp atmosphere assume a waxen pallor. There is frequently an hereditary element, a daughter being particularly likely to inherit the disorder from her father. The fingers never become blue, there is little or no pain, and the main complaint is of numbness, and of the unpleasant appearance of the fingers. In spite of the apparently complete arrest of the circulation from time to time, ulceration or gangrene of the fingers never occurs. Chalky deposits may form in the subcutaneous tissue as a result of ischæmia, but as this is a very rare complication, "dead fingers" need never cause anxiety. Though Raynaud included such cases in his original treatise, they are now regarded as a separate clinical group.

Secondly, in certain cases of primary structural disease of the arteries, cyanosis of the digits may occur as a result of exposure to cold, and this may lead to an error in diagnosis. The earlier stages of thrombo-angiitis obliterans of the vessels of the upper extremity may resemble Raynaud's disease very closely, and in older patients arterio-sclerosis may give rise to similar colour changes in the fingers and toes. These diseases are steadily progressive, leading to gangrene of the greater part, or even of the whole of several digits, and it is most important that they should not be confused with Raynaud's disease in which such extensive gangrene is never seen.

Of those afflicted by Raynaud's disease over 90 per cent. are women, and this sex-incidence must be borne in mind if errors in diagnosis are to be avoided. Almost all the men whose symptoms resemble those of Raynaud's disease are actually suffering from some form of obliterative arteritis.

TWO GROUPS OF CASES

The questions which the sufferer from Raynaud's disease will ask are whether she is to expect the disease to become steadily worse or to tend towards spontaneous recovery; whether ulceration will extend deeply and lead to gangrene of the fingers; whether all the digits are likely to become ulcerated to an equal extent; and whether the benefit to be expected as a result of sympathetic ganglionectomy will justify the operation.

It is commonly stated in text books that the mildest form of the disease will run its course in a few years, leaving the patient subsequently free from abnormal sensitivity to cold. This view is almost certainly fallacious, the tendency being for the symptoms to become more pronounced as age advances; but in a large percentage of cases the malady is not progressive. The most important factor in prognosis is the rate of progress of the disease in the first 2 or 3 years. If by the end of that period there are no trophic changes in the fingers it is most unlikely that these will appear later. It is thus possible to divide all patients suffering from Raynaud's disease into two groups: those who develop ulceration of the finger tips and scleroderma after 2 or 3 winters and for whom the outlook is bad, and those who show little or no tendency to trophic disturbances and who with reasonable care should be able to escape these complications indefinitely.

The improvement which occurs when a patient is living for a time in a warm climate may cause her to think that the disease has undergone spontaneous cure, but disappointment on returning to colder surroundings is inevitable. If, however, a patient is able to make her home permanently in a warm climate she may do so with the assurance that she will derive more benefit from the move than from any other form of treatment, and if the temperature is uniform she is likely to remain free from attacks. Even in this country the choice of occupation may have a considerable influence upon the attacks, though the advantage of working for part of the day in warm surroundings is not to be compared with the benefit of living in a warm climate. It may be helpful, however, if the patient can work in a kitchen or in a restaurant rather than in a warehouse or in the open air, and it is to be noted that typewriting seems to be a particularly unsuitable occupation for those who suffer from Raynaud's disease.

THE TYPE OF LESION

The ulcers which occur in uncomplicated Raynaud's disease remain shallow, healing in warm weather and recurring when a cold spell produces another "attack." Since ulceration and scleroderma are associated with permanent structural changes in the coats of the small arteries these complications will become more severe should any other form of arterio-sclerosis supervene. Massive gangrene is unknown, and should it be necessary to amputate a digit on account of painful ulceration, sound healing of the stump is to be expected. The disease very rarely ends fatally, but infection spreading from an ulcer is a possible cause of death.

Though all the digits become cyanosed in an attack it is remarkable that some suffer more severely than others. The thumb is usually the least affected, but the fingers vary considerably as regards the intensity of the cyanosis and the incidence of ulceration. Two or three fingers of each hand may remain free from complications for many years, and there is always a good chance that they may escape entirely. Should it be necessary, therefore, to amputate a badly ulcerated finger, the operation may be undertaken in the reasonable hope that complications of equal severity will not occur in the remaining fingers.

EFFECT OF SYMPATHETIC GANGLIONECTOMY

In predicting the effect of cervico-thoracic sympathetic ganglionectomy it may be taken as a general rule that the more severe the disease the less satisfactory will be the result of the operation. The severity of the disease varies directly with the degree of susceptibility to the action of cold, and this is not abolished by sympathectomy, the beneficial effect of which depends on paralytic vasodilatation. In the most severe cases, which are complicated by extensive ulceration and scleroderma, structural changes occur in the small arteries, and full vasodilatation becomes

impossible. Thus, though symptoms are relieved in almost all cases, the improvement is most marked when susceptibility to cold is of moderate severity and trophic complications are minimal. Operation will not be called for in the mildest cases because the disease is not progressive; it will be contra-indicated in the most severe form of the disease because the degree of vasodilatation obtainable will prove an inadequate safeguard against future attacks; but it will produce most gratifying results when the disease, though progressive, is of only moderate severity. Lumbar ganglionectomy can be relied upon to relieve the symptoms in the feet in all cases, the success of the operation being not only more certain but also more complete than that of cervico-thoracic ganglionectomy.

Though the hands may still become blue and cold after sympathectomy, the patient will no longer be debarred from working at various household and other occupations which necessitate exposure to cold, since prolonged exposure to more intense cold will be required to produce the attacks after operation. Besides the regaining of the use of the hands, one of the greatest benefits enjoyed as a result of operation will be the abolition of the pain previously experienced during the attacks of cyanosis and the period of recovery following them.

Operations for sympathetic ganglionectomy are practically free from risk to life, but there are certain drawbacks of which patients must be warned beforehand. For two or three months after cervico-thoracic ganglionectomy there is often troublesome aching pain in the shoulders and arms, and insomnia may be a disturbing feature, but both these complications, which seem to be due to a temporary upset of the circulation in the arms and in the brain, clear up spontaneously, though they may be severe enough to delay the patient's return to work for some weeks. The ocular manifestations of bilateral cervical sympathetic palsy are neither a handicap nor a disfigurement. After bilateral lumbar ganglionectomy male patients, though still potent, are likely to become sterile. The effect on the colon is to cause a moderate increase in its activity, which is usually rather an advantage, and incontinence of urine or fæces never occurs. These post-operative complications will not contra-indicate operation if the patient is suffering much pain and disability, but might cause one to hesitate before advising operation in the milder cases of Raynaud's disease.

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SPECIAL ARTICLES

MARIE CURIE

THE death occurred on Wednesday, July 4th, of Marie Curie, the joint discoverer of radium. The event occurred at the sanatorium of Sallanches (Haute-Savoie); she was 66 years of age.

Marie Curie was one of the group of discoverers which has, during the twentieth century, thrown new light on the fundamentals of physics. She may be said to have been inducted as a baby into the career which she was predestined to follow. The daughter of Prof. Sklodowska, of Warsaw, she was as a child familiar with laboratory work, and soon became her father's assistant. Possible involvement in political troubles under the Tsarist régime led her to leave Warsaw for Paris, where she obtained a post in the research laboratories at the Sorbonne. She rapidly became licencié ès Sciences Physiques et Mathématiques, and duly proceeded to the doctorate. In 1895 she married Prof. Piérre Curie, who had already publicly recognised the pre-eminent qualities of her scientific work, and they laboured together on the researches which culminated in the momentous discovery of 1898. The story of this discovery has often been told, but the principal epochs in it are as follows.

Henri Becquerel, in 1896, discovered that the crystalline double sulphate of uranium and potassium emitted a type of radiation which could penetrate a plate of silver opaque to light. He followed up this discovery by showing that the crystalline state had nothing to do with the phenomenon, and, further, that it was exhibited by the metal uranium itself. He suggested, to indicate the new natural manifestation, the felicitous term "radio-active," which is still retained for the large class of bodies which have been discovered in the intervening years. The outstanding work of Madame Curie, during an active collaboration with Prof. Piérre Curie, was the separation and identification of two new elements, one comparatively short-lived, named polonium after her native country, the other radium, which by the special circumstance of the length of its "average life," stands out conspicuously among the whole range of radio-active substances. Now, a substance like uranium is very feebly radio-active; on the whole, its atoms are breaking up exceedingly slowly—a gramme of the element would only decay to half this value in five thousand million years. Hence uranium is found in quantity; on the other hand, radon, the gas from radium, is transformed to half its value in just under four days, so that no really large quantity is available. From a gramme of radium the maximum volume of radon is just over half a cubic millimetre. Radium stands not only genetically between these two substances, but while being much more radio-active than uranium it is much less so than radon. Hence, ponderable quantities are available. The extraction of radium by Madame Curie from the pitchblende residues put at her disposal from the State manufactory of uranium in Bohemia, was a piece of work calling for the greatest skill, inventiveness, and patience. Within a few years of this discovery radio-activity became one of the most important phenomenon of physics.

Two outstanding matters in this connexion should be mentioned: first, the discovery by Lord Rutherford that thorium (the radio-activity of which was identified independently by Madame Curie and G. C. Schmidt) spontaneously gave off a radio-active gas; and, secondly, the vital interest to medicine of the application of X rays and radium. Those bold spirits, who had taken their courage in their hands and applied X rays to the body in therapeutic fashion, were not slow to do the same with radium once the similarity in the types of radiation was known. In 1910 the first International Congress of Radiology was held in Brussels, when the proceedings were attended by 500 delegates drawn from all quarters of the globe, Madame Curie, Rutherford, and Soddy being among the adherents to the new science. The congress asked Madame Curie to prepare a sample of pure metallic radium and to take the initial steps towards realising a standard of radium quantity. This was done in a remarkably short time, and

physical laboratories were for the first time in a position to make accurate measurements of quantities of radio-active bodies on an agreed basis. Further, the congress, planning to institute a practical unit of radium emanation (radon), desired to honour the name of Curie by associating it with the unit. A curie was designated as the quantity of radium emanation in equilibrium with one gramme of radium element. As so often happens with the practical units of the physicists, paradoxical though it may seem, a submultiplier of the unit—e.g., milli-curie—is more often used than the unit itself.

For the ten years of their married life she and her husband worked hand in hand, the association being terminated by the tragic death in 1906 of Prof. Curie in a street accident; but already she had, in association with him and Becquerel, been in receipt of the Nobel prize. She continued to work, at first alone, and later with various assistants and a daughter, and published researches in many scientific periodicals on the phenomena of radio-activity. In 1911 she received again the Nobel prize for her chemical researches, while the Royal Society conferred on her the Davy gold medal. Learned academies followed suit, and few can have enjoyed so many of these honorary distinctions as Marie Curie, but no parallel receipt of wealth rewarded her efforts although the French Government provided her with a laboratory in the Rue Piérre Curie; but in 1929 a present of £10,000 was received from women admirers in the U.S.A., enabling her to devote herself without anxiety to the labours which absorbed her. Madame Curie, during her later scientific years, saw a new era initiated by the work of her daughter, acting in collaboration with M. Jolliot, her husband. They discovered, contrary to the opinion held for over 30 years, that some substances could be made radio-active. It is true that the effect is a very small one and lasts for a comparatively short time, things which in no way detract from the importance of the discovery, while history would seem to show that the beginnings of great things are often of very modest dimensions. It was a happy finale for Marie Curie to see her work being continued so brilliantly in the family circle.

Madame Curie was a great scientific figure and her name will live as one who enriched the fields of science and added a weapon to those previously wielded by medicine in its fight for health.

INTERNATIONAL HEALTH AGREEMENTS

THE WORK OF THE OFFICE INTERNATIONAL D'HYGIÈNE PUBLIQUE (PERMANENT COMMITTEE)

SEVERAL matters of interest are dealt with in a résumé just issued from the Office International d'Hygiène publique in Paris on the proceedings at the April–May session of the permanent committee of that body, which was attended by the delegates of 39 Governments under the presidency of Sir George Buchanan. The work, as in previous sessions, concerned in part the settlement or application of international agreements between governments on health questions and in part a comparison of data on topical questions of epidemiology and hygiene.

INTERNATIONAL AGREEMENTS

In the first of these categories came the question of standard quantities to be recommended in the case of ships being deratised by sulphur for the purpose of the International Sanitary Convention of 1926.

Deratisation.—The committee agreed to a report to be presented to health departments concerned dealing separately with fumigation by burning sulphur, by burning mixtures of sulphur and charcoal, by sulphur dioxide in cylinders, and by the use of the Clayton apparatus. Special attention was given to the allegation that jute sacks or gunny bags loaded in Calcutta had been responsible for the importation of plague into various places on the coast of South America. Suspicions of this method of transmission were supported by circumstantial evidence, but the Committee was unable to regard the thesis as fully proven, and recommended its further consideration when additional data are obtained by the Pan-American Sanitary Conference which will be held at Buenos Aires in November.

An opinion was expressed adverse to giving certificates that ships have been effectively deratised when the holds of the ship have not been emptied before the deratisation process. Some agreements between individual countries for facilitating quarantine operations were noted and facilitated. Among these is a system by which in northern European ports from Brest to the mouth of the Elbe, including British ports, the port sanitary authorities follow a system of direct communication one with another in regard to infectious diseases on ships. A more important agreement, particularly from the shipowners' point of view, is that by which a considerable number of countries are now concluding an accord to dispense either with the production of a bill of health or, at least, with the requirements that bills of health should bear visas obtained from their consuls in foreign ports.

Air Traffic. Yellow Fever.—In connexion with the extension of international health regulations to air traffic which has been effected by the Hague International Sanitary Convention for Aerial Navigation, 1933, the committee gave its attention to evidence that on some air routes mosquitoes are habitually carried from country to country by aircraft, and decided on a study of the most effective methods of clearing aircraft from these insects. Note was also taken of the progress made in the application of the mouse protection test in regions of Africa to determine whether particular regions show evidence of the existence within recent years of the virus of yellow fever infection. A study was undertaken of the significance in this respect of what are termed "silent areas"—i.e., those in which a material proportion of positive results to the mouse protection test are obtained but in which there has never been evidence of the actual presence of yellow fever. An investigation of the several questions arising out of these findings is being pursued.

Venereal Diseases. Opium.—The International Agreement of Brussels, 1924, which provides for the treatment of merchant seamen suffering from venereal diseases, received further attention, and a modified form of the international card given to the seaman has been proposed to the signatory Governments. Finally, the Committee reverted to a previous decision that for the purpose of the Opium Convention of 1925 an exemption should be made for ampoules of sterilised solutions of morphine and atropine containing as maxima 2 per cent. of morphine salt and 0·05 per cent. of atropine salt. It appeared that there was some risk of the use of these preparations as drugs of addiction, even when put up in this way. A further investigation was decided upon.

TOPICAL QUESTIONS OF EPIDEMIOLOGY AND HYGIENE

The second branch of the work of the session needs less notice since the different contributions on epidemiological and public health subjects will in due course be published in the monthly *Bulletin* of the Office International d'Hygiène publique. Notable among these contributions are reports from the Yellow Fever Commission of the Office based on work in Africa and America, associated with that of the Rockefeller Foundation, on the distribution and transmission of yellow fever, including a discussion of the "silent areas" above mentioned. Recent work on vaccination against yellow fever by attenuated viruses and by the serum of immunised horses was reviewed.

Cholera.—The question of the degree of danger presented by the healthy carrier of cholera vibrios, or vibrios allied to them, constantly arises in quarantine practice, and comes repeatedly before the Committee. A new stage was reached at the present session. It was announced to be the intention of the Indian health service, with the aid of the Indian Research Fund Association, to follow the recommendations pressed at previous sessions, and that a carefully planned scheme of work on typical and atypical vibrios will now be undertaken in suitable areas in India under conditions which permit the bacteriological results and the appearance of clinical cholera to be studied in association. Special attention will in this connexion be given to typing by sugar fermentation and also to the use of serums prepared from a heated antigen, as proposed by Bruce White. The Committee had been asked to specify the dosage of cholera vibrios necessary where protection has to be given by a single inoculation. With certain cautions and reservations, it adopted the figure of 8000 millions as an average dose for this purpose. A proposal to give official recognition to cholera prophylaxis by the administration of vaccine per os was rejected.

Small-pox and Vaccination.—An omnibus report presented by the subcommittee on small-pox and vaccination on modern methods of vaccinating and the effects of vaccination was accepted and will shortly be published. Further contributions were received on neurovaccine, and on dried vaccine, as well as on vaccine virus grown on the allantoic membrane of the hen's egg in incubation. The latter included a report by Goodpasture and others, presented by the delegate for the United States, covering some 1000 vaccinations done with this virus in schools in Tennessee, which yielded normal results and an insertion success of 94 per cent. The Committee considered that it remains desirable to destroy lymph from calves which, on post-mortem examination after the collection of lymph, are found to have tuberculous lesions.

Virus Diseases.—Some new epidemiological data regarding the increase of typhus in several countries were supplied; note was taken of the general interest which attaches to the work of Wilson Smith, Andrewes, and Laidlaw on the nature of the influenza virus, and arrangements were made for further international studies of the incidence of Weil's disease and leishmaniasis in Europe and along the basin of the Mediterranean. The present distribution of psittacosis shows that the particular preventive measures taken in the several countries affected need to be adjusted to very different circumstances, and that, while there has been a definite gain to European countries by their having acted together in 1931 to prohibit all importation of parrots at their ports, this joint action no longer has the importance which it then possessed.

On more general questions of hygiene it may be noted that a report is to be presented on the practice and results of "terminal disinfection" in different countries.

ROYAL SANITARY INSTITUTE

THE annual health congress of this institute was held at Bristol on July 9th–14th. The inaugural address was delivered by Mr. S. H. BADOCK, pro-chancellor and treasurer of the University of Bristol, who sketched the history of preventive medicine and outlined the present position of the fight against disease. He pointed out that the general attitude to the physician was still too often that of the woman who showed her bathroom to her visitors remarking: "Thank God, we have never had to use it yet." He criticised the long intervals between school medical examinations, the lack of correlation between school medical services and adolescent health care, and the prevalence of tuberculous milk.

The Presidential address to the section of preventive medicine was delivered by Prof. W. W. JAMESON, who recounted his experience in a tour through India and Malaya. The first problem that attracted attention, he said, was due to the magnitude of the population: more than 350 millions of people lived in India and only 17 per cent. of the men and 2 per cent. of the women were literate. There was a fairly comprehensive system of curative medicine, and research work of the highest class was in progress, but there was a lack of advance in sanitation and preventive medicine. Until the people had reached a higher educational and economic level some powerful force from the Central Government was necessary. The religious and political problems added enormously to the difficulties of public health workers, but Malaya was far less troubled by such problems, and the experience of rubber growers that antimalarial work was good business had greatly helped the sanitation of the country.

NUTRITION

Dr. H. E. MAGEE spoke on nutrition and the public health, emphasising the close association between these two subjects and deprecating the lack of coöperation between physiology and public health. There had been much research work on animals but not enough on mankind. A criterion of normality was urgently needed and a test for the early departures from normal. The many and discordant methods employed in the artificial feeding of infants showed that the correct method had yet to be discovered, and there was still a conflict as to the ætiology of dental caries. Ignorance and prejudice—as well as poverty—played a large part in malnutrition. Public health was more than a science, it was partly an art, and nowhere would the health officer be called upon to exercise his art more skilfully than in educating his people to correct dietetics and in breaking down prejudice and fads.

Prof. R. H. A. PLIMMER, speaking on the same subject, discussed the total quantity necessary for nutrition and the special importance of salts and vitamins.

The presidential address to the section of hygiene of food, which met in conjunction with the food group of the Society of Chemical Industry, was delivered by Mr. L. H. LAMPITT, D.Sc., Chairman of the Group. His remarks concerned the manufacture of ice-cream, and he declared that there was no reason why this increasingly popular material should not be kept absolutely sanitary.

Mr. J. MATTHEWS, of the Aluminium Plant and Vessel Co., also read a paper on ice-cream, showing the developments which have taken place and are still taking place in the equipment for preparing and distributing this commodity. The manufacturer has to provide plants for cleaning and sterilising and finds stainless steel almost ideal; the engineer, however, finds it rather difficult to handle. The ingredients have to be pasteurised, mixed, homogenised, and finally cooled. Mr. Matthews described the various pieces of apparatus which had been found most satisfactory for the divers processes. The adoption of package ice-cream was, he considered, a great step forward and all phases of production were being speeded up. The temperatures used were being carried to still lower levels and modern processing equipment gave ease and certainty of bacteriological control.

Mr. J. R. BARKER, M.R.C.V.S., discussed the legislation concerning milk, and claimed that the milk from tuberculin-tested herds was safer than pasteurised milk from the point of view of tuberculosis risk. He also pointed out that there were pecuniary advantages in establishing tuberculin-tested herds, even under the present milk marketing scheme.

He urged clearance of slum cowsheds and the encouragement of the rearing of cattle free from tuberculosis and provided with a resistance to it. Breeders and rearers of beef cattle knew how to do this and the knowledge was available to the dairy herdsman.

MATERNITY, CHILD WELFARE, AND SCHOOL HYGIENE

Dame JANET CAMPBELL read the presidential address to this section, reviewing the history and present position of the services. She concluded that substantial progress had been made and that permanent services had been established which would compare very favourably with anything done in other countries. The machinery set up had contributed materially to an additional improvement in the physique of children and had unquestionably saved many women and children from serious damage to health and nutrition. At the same time it was important to appreciate the incompleteness of these services and the impossibility of expanding them without the coöperation of local authorities.

Dr. J. GREENWOOD WILSON asked the question: "Does breast feeding matter?" and answered that modern medical literature showed a divided opinion on this subject. Probably the truth lay between two extremes. Breast feeding had great advantages which should be recognised by medical men and pointed out to their patients, but on the other hand they must recognise the restrictions it placed upon the mother and realise that the individual woman must be studied, just as the individual child must be studied when the feeding was artificial.

POSTURE

Miss M. FORRESTER-BROWN spoke on posture and its relation to health, pointing out that a child's natural instinct kept it rolling on the ground, climbing, swinging, turning somersaults, and dropping to sleep after meals, but that school routine reversed all this. Yet we were surprised after nine years of this treatment to find young lads and girls lacking in initiative and enthusiasm for work. Many American colleges had started departments for dealing with this aspect of education, and industrial firms had prospective workers graded as to posture and body build so that they might be put to work suitable to their type. Artists and writers had paid much attention to bodily posture, and it seemed strange that the subject should have been much neglected by educationists and gymnasts. Far too many of them even now seemed to think that the aim should be strength in individual muscles instead of that exquisite balance among many muscle groups which gave poise both in movement and in repose. Miss Forrester-Brown then explained the right way of standing, sitting, and lying, and pointed out that the attitude induced by the ordinary lounge chair should never be used, for it over-stretched the spinal joints while crowding up the abdominal organs and interfering with the full expansion of the lungs. The chief single factor in maintaining good posture was the tone of the abdominal muscles balancing the back muscles. The balance of the trunk was the same for practically all varieties of exercise; the spine was intended to be used as a spiral spring, but never to bend as a hinge. The best exercise to tone the abdominal muscles was the full, deep breathing of the Italian singers' type, learnt lying down. The importance of rest and of education in balance showed that manual labourers should take their recreation in light sports demanding coördination and skill, while the sedentary worker needed more vigorous exercise.

MENTAL HYGIENE

The problem of the mentally defective was discussed by Dr. H. HERD, who described it as a multi-factorial one. The defective had to be considered as an individual, as a member of the present community, and in relation to the community of the future. There was still inadequate ascertainment of defectives of school age, too much education of the ineducable, and a danger of high-grade cases being assessed above their merits and therefore not officially ascertained. Dr. Herd discussed the evidence before the Departmental Committee on sterilisation and approved its findings, while holding that voluntary sterilisation would leave the problem as large and as clamant as before. The defective, particularly the high grade, had possibilities which had not yet been fully exploited; socialisation could be made a practical policy. For the pathological low grade he put in a plea in favour of euthanasia.

Dr. ISABEL G. H. WILSON pointed out the wide relationship between the Mental Treatment Act and maternity and child welfare. The pregnant woman might often benefit by treatment as a voluntary patient. Puerperal cases were suitable for temporary treatment. The Urgency Order, now extended to the rate-aided patient, enabled the authorities to remove from home a violent or frantic patient who was terrifying or even endangering her children. The mother, returning after treatment, might be unable or unfit to look after her home and family; here the provisions of the Act relating to after-care came to their aid.

Miss F. B. UDELL described the value of the health visitor in health propaganda. In her opinion leaflets were extremely useful, but the widespread distribution of health literature without verbal instruction thereon was of little or no value. Much good work could be done by group instruction at clinics about sewing, housekeeping, cooking, economical and wise shopping, feeding and care of infants, infectious diseases, the value of prophylactic inoculation, dental caries, and defective vision. Every point must be followed up in the individual home. The teaching of the health visitor must be done in such a way that it stimulated the natural desire for knowledge inherent in all women.

MEDICINE AND THE LAW

Misreading of a Label

AN unfortunate misreading of the label on a drug bottle was investigated at a Birmingham inquest last week. The jury returned a verdict of death by misadventure, attributing negligence to the sister in charge of the hospital ward concerned, but making it clear that the negligence did not amount to gross and culpable negligence. A 20-months-old child had been brought to the hospital suffering from throat obstruction. Its breathing had been so seriously affected that it was almost dead on arrival. An operation was performed to permit breathing from below the point of obstruction; an anæsthetic was not necessary. Artificial respiration succeeded and the child began to breathe again. The obstruction freed itself; the child vomited and a piece of bone was dislodged. Later the child became restless and the sister in charge of the ward sent for the resident surgical officer who ordered a dose of nepenthe. The sister poured out a dose from a bottle on which the dose was labelled as "Five minims to 40 minims."

She misread this, as she afterwards realised, as having stated "five minims in 40 minims." She thought the drug was diluted down to one in eight. The dose ordered by the surgeon had been five minims. The consequence of her mistake was that she gave a dose eight times too strong. There was evidence that the bottle was of an unusual type with which the sister would be unfamiliar. The foreman of the jury said that the jurymen were satisfied with the arrangements made at the hospital for dealing with drugs. It was evidently, as the coroner observed, one of those human errors which no training or precautions can entirely eradicate. The incident shows the importance of obtaining the utmost possible standardisation in labelling.

IRELAND

(FROM OUR OWN CORRESPONDENT)

UNIFICATION OF NATIONAL HEALTH INSURANCE

AT the opening of the new offices of the Unified National Health Insurance Society on July 7th the chairman of the society, Mr. D. O'Donovan, stated that during the past six months 25 approved societies had been transferred to the Unified Society, including 10 of the largest which operated in the Irish Free State. The total membership transferred was about 310,000, to which were to be added 20,000 new entrants to insurance. About three-fourths of the insured population were now in the society. He hoped to have the remaining societies transferred during the next six months. The chairman went on to criticise the present system of flat-rate insurance, which, in his opinion, rendered their energies unproductive. He regarded it as essential that benefits should be related to the social and financial position of the individual insured person. He hoped that before long they would have a comprehensive scheme of insurance embracing all workers within its scope regardless of their rates of remuneration. Mr. Sean T. O'Kelly, Minister for Local Government and Public Health, in declaring the building open, said that he looked to the unification of national health insurance as laying the foundation of a new scheme of social insurance in general for the people of the country.

A HOSPITAL VENTURE

It was announced last week that the authorities of St. Vincent's Hospital, Dublin, have purchased a demesne of some 45 acres at Elm Park, Merrion, some 3 miles from the centre of Dublin. The property, formerly a seat of Lord ffrench, has recently been used as a golf-links. No statement has yet been made about the intentions of the hospital authorities in regard to their new purchase, but it is believed that St. Vincent's Hospital will eventually be transferred from St. Stephen's Green to the new site. The hospital, which celebrated its centenary a few months ago, is greatly cramped for space in its present site, and has no possibility of extending its borders.

CORRESPONDENCE

BACTERIOPHAGE IN CHOLERA

To the Editor of THE LANCET

SIR,—May I draw your attention to a slip in your very kind and valuable editorial on Bacteriophage in Cholera in THE LANCET of July 7th. Referring to cholera in the untreated and treated districts of Darrang and Nowgong the writer says :—

> "The figures show that in Darrang the death-rate, taking the average of three-year periods, fell steadily from 1924–26 to 1930–32 and in 1930–32 was lower than had ever previously been recorded, though remaining at a level considerably above that of Nowgong."

The three-year period cholera death-rates per 10,000 for these districts were :—

	Deaths per 10,000 per annum.	
	Darrang.	Nowgong.
1923–25	8·9	12·2
1924–26	11·6	14·6
1925–27	16·1	24·3
1926–28	11·7	15·7
1927–29	9·6	14·4
1928–30	4·5	4·3
1929–31	4·3	2·9
1930–32	6·0	0·7

The treatment of Nowgong with phage began in December, 1929. Perhaps you will kindly draw the writer's attention to these, for the comment as it stands might mislead those who have not access to the original paper.—I am, Sir, yours faithfully,

London, July 7th. J. MORISON.

*** *Moving* averages were not referred to in our article, but actual averages for each three-year period. Thus the average annual death-rates of Darrang were 11·6 in 1924–26, 9·6 in 1927–29, and 6·0 in 1930–32, while the corresponding rates in Nowgong were 14·6, 14·4, and 0·7. The rate in Darrang in 1930–32 is lower than any recorded in the consecutive three-year periods back to 1906 and, roughly, only half the rate for 1924–26. These figures, we suggest, bear out the comment in our leading article.—ED. L.

THE DISTRICT ALMONER

To the Editor of THE LANCET

SIR,—I was glad to see both in *The Lancet* and in the *British Medical Journal* of June 30th a reference to the value of the hospital almoner, and a suggestion that there should be district almoners.

I have long held the view that some extension of the almoner service to others than those who happen to be attending a hospital was desirable. In the course of my work (though quite outside it) I am not infrequently written to or rung up and asked to put people in touch with organisations or institutions able to help. Sometimes I can do so, but generally my only course is to write to one of the lady almoners whom I happen to know and who invariably give me all the help or information that is necessary. When, as sometimes happens, the inquirers are in perfectly good financial circumstances, there seems no reason why they should not pay a fee for such information. They would, I feel sure, gladly do so and money so raised would go towards meeting any expense involved in placing at the disposal of all who might wish to take advantage of them, services that can do so much to smooth out difficulties that are common to all. At the moment these services are restricted to one class of the community.

I am, Sir, yours faithfully,

R. H. P. ORDE.

The British Hospitals Association, Grosvenor-crescent, London, S.W., July 5th.

THE ST. JOHN CLINIC

To the Editor of THE LANCET

SIR,—To your note on the Order of St. John of Jerusalem in THE LANCET of June 30th, which showed the close association between the Order and the medical profession, might well be added the fact that the Order is now in control of this clinic, which formerly was called the London Clinic, and is now named St. John Clinic and Institute of Physical Medicine. While the Red Cross has its clinic in Regent's Park for the treatment of rheumatic and allied conditions, so the Order of St. John has one in Pimlico. The clinic is giving about 3000 treatments per week, and is serving a very real need in providing methods of treatment by the expensive apparatus used in physical medicine, which the patient is unable to obtain from his panel doctor.

During last year there was added to the clinic an X ray department and three new baths, including a paraffin wax bath which is of new design and affords great relief to patients; 112 treatments were given last week with this paraffin wax bath, and all the patients seem to bless its influence.

I am, Sir, yours faithfully,

LEONARD HILL,
Supervisor, St. John Clinic.

Ranelagh-road, London, S.W., July 6th.

A DISCLAIMER

To the Editor of THE LANCET

SIR,—My attention has to-day been drawn to an article in the *Empire News* which refers to me by name and prints my photograph. I was entirely ignorant of the whole matter till to-day, nor have I the slightest knowledge as to how the material for the article, or the photograph, were obtained.

I am, Sir, yours faithfully,

Harley-street, W., July 10th. HENRY YELLOWLEES.

PANEL AND CONTRACT PRACTICE

Clerical Work

THE Glamorgan insurance committee recently recommended that £10 should be withheld from a practitioner's remuneration because of failure to comply with regulations requiring him to send in records on request and failure to reply to communications addressed to him by the clerk. He had been interviewed by the committee on a previous occasion, when he had promised to post off the records required the same night. He did not do so. This type is quite common in the insurance world, and it does no good to the profession when these facts are published in the daily press. While there may be no reflection upon the doctor's capacity professionally they do reflect on his organising ability. The keeping of records and the answering of letters promptly are very largely questions of method and temperament If a practitioner dislikes this kind of work—which incidentally is important to his whole practice apart from his insurance obligations—he will often find that the services of a secretary, even for a few hours a week, are sufficient to free him from much worry and anxiety. Furthermore, in getting this help he will be assisting his brother practitioners, for they require the record cards he fails to send. Lastly, there is no disputing the fact that a prompt and courteous correspondence with the clerk of the insurance committee—who, after all, is only carrying out the committee's instructions—puts him in much better favour with that tribunal's medical service subcommittee if and when they have to deal with some complaint against him. The small outlay required will amply repay itself in the end.

The Causes of Incapacity for Work

The Department of Health for Scotland has just issued its third report on illness in the insured population. It deals with the year ending on June 30th of last year.

In a population of 1,768,872, the total volume of incapacitating sickness was over 18 million days, being 10 per cent. more than for 1931–32. The increase is greater among men than women, and among women it relates only to the unmarried, since the married show an improvement of 5·8 per cent. It is partly attributable, no doubt, to influenza, but this cause in fact accounts for only 30 per cent. of the increase in days of work lost. The balance is almost entirely due to an increase in the average duration of illness, which was 9·44 days for males, 12·36 for females, 11·05 for single females, and 21·52 for married. Among the causes of incapacitating sickness respiratory disorders amount to some 45 per cent., and they account for 23 per cent. of the total days lost. As regards duration of incapacity, influenza generally takes 15 days; appendicitis 59; pregnancy 40; nervous debility 80; and neurasthenia 122. The following figures denote the number of cases per 100,000 insured persons.

—	M.	F.	Average duration in days.	
			M.	F.
Tuberculosis	128	153	432	473
Anæmia	20	1000	93	53
Infective diseases	269	565	34	38
Gastric and duodenal ulcer	258	92	87	97
Appendicitis	312	597	57	61
Neurasthenia	96	211	145	101

M. = males; F. = females.

It will be noticed that "anæmia" and "neurasthenia" is a less frequent form of incapacity in men than in women; but when the men do give up work for these reasons they take much longer to become fit again. The following figures show the difference in the rate of recovery by the three groups—males, married females, and single females—in various age-groups in the two commonest incapacitating illnesses—influenza and respiratory troubles. The figures give the average duration of incapacity in days.

—	Age			
	under 20.	20–25	25–30	50–55
INFLUENZA				
Males	13	13	13	18
Married females	26	21	22	23
Single females	15	16	16	23
RESPIRATORY DISEASES				
Males	16	15	15	17
Married females	24	23	28	33
Single females	17	16	19	24

The question arises why a married woman under 20 should take nearly twice as long to recover from

influenza as a man or a single girl of the same age. In the respiratory group again the married woman takes much longer to recover and both sets of figures show how the married woman obtains more days' sick pay for her illnesses than the man or the unmarried girl.

The days of incapacity per person are 10·8 in the burghs and 9·6 in the counties, both being higher than last year. Taking individual burgh committee areas, in Dumfries and Maxwelltown it takes the average case 15 days to get well; this is the highest for the Scottish burghs. In Greenock, on the other hand, the average is 7·9 days, this being the lowest. The figure for Edinburgh is 8·4 days. The highest figure for the county committee insurance area is 12·4 days (West Lothian and Zetland). The lowest figure is 6·2 in Perth—exactly a half.

It is estimated that influenza cost the funds £220,000; rheumatism £235,000; and all respiratory diseases, including influenza £515,000. When the money is paid out the age-group which receives the most is that from 20–25—namely £295,000. But this group is larger than any other, containing about 16·3 per cent. of the males and 25·6 of the females. The group 25–30 comes next, receiving £230,000, and the sumsthen gradually fall away until we reach group 50–55, which receives £120,000. It then rises for age-group 55–60, which receives £135,000, up to group 60–65, which gets £225,000.

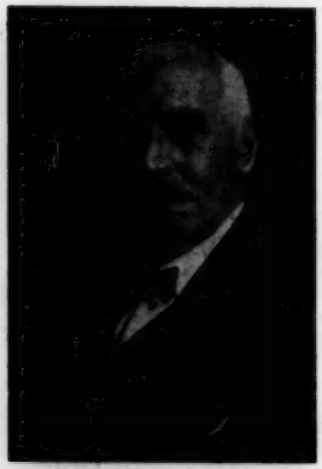
OBITUARY

SIR JAMES KINGSTON FOWLER, K.C.M.G., K.C.V.O., M.D.

CONSULTING PHYSICIAN TO THE MIDDLESEX AND BROMPTON HOSPITALS

WE regret to announce the death of Sir James Kingston Fowler, consulting physician to the Middlesex Hospital, which occurred on July 3rd at his country house at Beaulieu, Hampshire.

James Kingston Fowler was one of the large family of the late Mr. James Fowler of Woburn. He was born in 1852 and educated at King's College, London, proceeding to King's College Hospital for his medical training. He qualified as M.R.C.S. Eng. in 1874, and held a series of house appointments at his hospital, after which he became house physician to the Addenbrooke's Hospital, Cambridge, entering at the same time Gonville and Caius College as an undergraduate. The post of resident at Addenbrooke's at that time was one of two or three years' duration, and Fowler was admitted to the usual privileges and restrictions of an undergraduate at Caius while living in the hospital. Though rather older than the men of his year, he was a popular member of the college and made many close friends. He graduated in arts and medicine, proceeded to the M.D. degree in 1884, and had in the meantime become M.R.C.P. Lond. In 1886 he was elected F.R.C.P., having been appointed to the staff of Westminster Hospital as pathologist and curator of the museum. This appointment was held for a very short time when he became in the same year assistant physician to the Middlesex Hospital and to the Brompton Hospital for Diseases of the Chest. At both institutions he gained much and deserved credit for his work as clinician, teacher, and lecturer, and the well-known treatise on diseases of the lungs which appeared in 1898, written in collaboration with Rickman Godlee, was a proof of the use to which he had put his opportunities in both places. No doubt the excellent order with which the information in "Diseases of the Lungs" was marshalled, the clearness of arrangement, and the due proportion of space allotted to the different subjects, were assisted by the fact that shortly before its appearance Fowler had edited a "Dictionary of Practical Medicine" by various writers, which met with considerable success, being regularly republished for nearly 30 years. The work of Fowler and Godlee proved an important addition to the literature of scientific and practical medicine, and brought home to readers 40 years ago the lesson—a commonplace to us now—that subjects ought not to rest wholly within the province of either physician or surgeon for their complete exposition. Fowler was the main author, but Godlee collaborated throughout and in special sections; the work, from the moment of its publication, took its place as a standard authority on a subject of high importance.



SIR JAMES KINGSTON FOWLER
[Photograph by Elliott & Fry

Fowler's interest in medical education was every whit as influential as in clinical medicine. He was not only a sound and careful teacher, but an experienced examiner, having discharged examining duties in behalf of Cambridge University, the English Conjoint Board, and the War Office. He knew the standards needed in the varying circumstances, and he knew the qualities of varying groups of students. Now in 1900 the University of London was reconstituted with the intention of strengthening the ties between it and the metropolitan institutions engaged in higher education within a radius of 30 miles of the centre. Under the new plan institutions situated within the administrative county, and not carried on for the private profit of owners, could be admitted as schools of the University, with the result that the medical schools of the London teaching hospitals, while preserving their independence, were also recognised as an integral part of the University. The absence of proper facilities for graduation at their University by London medical students was at that time a subject of wide dissatisfaction, and more than one scheme, intended to remedy what was felt to be a hardship, had been put forward previous to the reconstitution of the University. Fowler had been a moving spirit in at any rate one such scheme. And so, with the arrival of the reconstitution of the University, he became prominent in promoting medical graduation among the London schools. As a member of the Senate he was not wholly a success; possibly he knew too much, for although he made his points he gained them slowly and sometimes with difficulty. He was better seen at meetings of a more homogeneous and less formal nature; here his was a valuable voice, and he was both wise and

courteous in laying before the permanent staff questions of procedure when they became of a technical character, which was not unusual in the working of the complicated machinery of the University. The value of his services was expressed by his election as dean to the faculty of medicine, a significant compliment to the medical man chosen, for the vote is a testimony of a large electorate to ability and loyalty.

Arising out of his interest in medical education in this country and in the opportunities for the employment of British graduates overseas, Fowler was early brought into contact with the Colonial Office. He served on a departmental committee whose recommendations led to the establishment in 1909 of a Colonial Advisory Medical Committee with himself as one of its first members. The work of this committee, though in kind it was apparently far removed from his other professional activities, became one of the chief interests of Fowler's later life, and he continued to take an active part in it even after his removal from London to Beaulieu. His wise, shrewd, and kindly counsel was greatly valued in the Colonial Office, and his advice influenced in a large way the development of medical services throughout the Colonial Empire. He was indeed deeply concerned to ensure that the medical personnel of the Colonial Service should be adequate in quality for what he conceived to be its great task, and as chairman for many years of a Medical Appointments Board he laboured with this object in view, with results that are now known. His services in this and other capacities in the Colonial Office contributed greatly to the improvement of health conditions in the tropical colonies and towards the enhancement of the prestige of British medicine overseas.

Sir James Kingston Fowler continued to serve until his death as a trustee for the Beit Memorial Fellowships, but his main work was done during the long period of 21 years in which he was also honorary secretary. Both the inception and the successful development of the scheme were due in great part to his influence. During his earlier training as a physician he had worked in several medical schools, and he was therefore able to rise above that intense but narrow loyalty which often makes a man keen to serve his own school but less concerned for the university. When dean of the Medical Faculty of London University he supported strongly the plans for centralising the teaching of preclinical subjects in some large institutes, and for this purpose his medical acquaintanceship with the great South African financiers enabled him to obtain a gift from Mr. Alfred Beit. The proposed institute was never built, and the money was returned after Alfred Beit's death to his brother, Sir Otto Beit. Sir Otto took this nucleus of £50,000, added £165,000 in his own gift, and established in 1909 the Trust for the Beit Fellowships. Fowler, both as original trustee and as secretary of the Advisory Board, was in a central position for guiding the subsequent development of the Trust, and he used his knowledge of men and of practical affairs with a characteristically clear judgment which influenced most happily all that was done. When the Advisory Board met at his house for the selection of Fellows each year, Fowler would deliberately abstain from much comment on the merits of the candidates, for he had taken care that all other members of the Board were Fellows of the Royal Society and he deferred to their judgment in matters of scientific work. "But every now and then," we are told by one who had sat at the Board with him, "he would end a debate by stating some clear-cut principle of which his experience of life had taught him the value—it was an action not unlike the swoop of the hawk, the hunting bird that he admired." The decision to create a senior Fellowship in 1927 for work in tropical medicine reflected Fowler's own interest in that subject since the time when he had been chairman of the Yellow Fever Commission for West Africa. He watched the studies of the Fellow with the most eager sympathy and was deeply disappointed when this promising work had to be stopped owing to the danger of its continuance in London. Not many of his colleagues on the Beit foundation knew him personally, and it was impossible for him, trained as a clinician, to follow their investigations along the intricate ways of the modern sciences ancillary to medicine. Fowler viewed the work of the Trust rather as a whole, and he was proudly conscious that that work was good during all the 21 years in which its guidance lay in his hands.

In 1907 Fowler was president of the Medical Society of London, in 1910 was appointed K.C.V.O., and shortly afterwards he became consulting physician to the Middlesex Hospital and to the Brompton Hospital. On the outbreak of war he was appointed consulting physician to the British Expeditionary Force with the rank of Lieut.-Colonel, and was mentioned in despatches and received the C.M.G. at the termination of hostilities. He was promoted K.C.M.G. in 1932 on his retirement from the Medical Appointments Board of the Colonial Office and in recognition of services rendered as chairman of the Yellow Fever Commission of West Africa.

Apart from the publications already mentioned, Fowler contributed the articles on bronchiectasis and syphilis of the lung to Allbutt and Rolleston's "System of Medicine," wrote a treatise on pulmonary tuberculosis, which appeared in 1921, and in various quarters upon the problems in tuberculosis. After his retirement he issued an interesting history of Beaulieu Abbey, of which he was warden, a post that gave great satisfaction to his deep antiquarian tastes.

BRENNAN DYBALL, M.B. Lond., F.R.C.S. Eng.

SURGEON TO THE ROYAL DEVON AND EXETER HOSPITAL

THE death occurred on June 29th of Mr. Brennan Dyball, an outstanding figure in Exeter and neighbourhood as surgeon and ophthalmologist. He was born in 1872, and received his medical education at St. Thomas's Hospital, where he was Beaney scholar in surgery. He had an outstanding career as a student, for immediately after taking the English double diploma he graduated as M.B. Lond. with honours in medicine and obstetric medicine, while at the examination for the B.S. he obtained the University scholarship. At St. Thomas's Hospital he was house surgeon and assistant demonstrator of practical surgery in the school, and was for a time resident medical attendant to the Hospital for Sick Children in Great Ormond-street. He next became resident surgical officer to the General Infirmary in Leeds. Some 20 years ago he commenced his long association with Exeter by appointment as anæsthetist to the Royal Devon and Exeter Hospital, to which institution he became assistant surgeon in 1912, and later full surgeon. At the same time he was surgeon to the Sidmouth, Exmouth, and Winsford cottage hospital, and held other positions of professional responsibility.

Dyball achieved his fine position through the thoroughness of his work, and his sterling qualities

of character. R. A. W. writes of his colleague and friend: "By the death of Brennan Dyball the medical world in Devon has lost a pillar of strength. To those who knew him intimately he was a most engaging personality. His intellectual gifts were exceptional, and being an omnivorous reader there seemed to be no subject upon which Dyball could not illuminate a discussion. He was by nature shy and retiring, and anything savouring of self-advertisement was abhorrent to him. He hated public speaking, and on this account could never be induced even to take the chair at a dinner. Nevertheless he did an immense amount of work on hospital committees, and his insight and judgment were such that most of his colleagues were only too ready to follow his lead. He was absolutely free from pose, had a complete intellectual honesty, and a kindly sense of humour. In all affairs his sincerity and disinterestedness were so obvious that he never seemed to make an enemy, though he was tenacious of purpose. Money appeared to mean little to Dyball. It was far easier to get him to operate than to induce him to collect his fee. He started with some years of general practice, and acquired a clinical judgment out of the ordinary. I have heard it said that he was as good a physician as a surgeon, and as an abdominal surgeon he was in the first rank—at his best, perhaps, in a tight corner. An unexpected condition in the abdomen, at a house far away in the country, lighting not too good and instrumentarium limited—then Dyball was brilliant. Since the war he had interested himself in bone and orthopædic surgery, where a flair for carpentry showed itself in the neatness and ingenuity of his work. He shares with Dame Georgiana Buller the credit for the planning and organising of the Princess Elizabeth Orthopædic Hospital in Exeter, which has inaugurated an extensive service for cripples in Devonshire. There is no doubt that Dyball shortened his life by overwork, notably by the thoroughness with which he carried out a mass of voluntary and unpaid labour. For several years he undertook a large proportion of the operative work at the orthopædic hospital which, in addition to that at the Royal Devon and Exeter Hospital and an extensive private practice, was really too much for one man who worked as conscientiously as Dyball. This tribute is from one who has worked with him for close on 25 years and owes much to his friendship."

Mr. Dyball died at his country cottage in Haytor. He had been operated on three weeks previously, had left the hospital, and appeared to be making a satisfactory recovery in his moorland retreat when the sad end occurred.

JOHN FREDERICK JENNINGS, M.B., B.S. Lond., F.R.C.S. Eng.

WE regret to announce the death, at his house in John-street, Mayfair, London, of Dr. John Frederick Jennings, one of the best known general practitioners in the district.

Born at Cardiff in 1875, the son of Mr. T. M. Jennings, J.P., a shipowner, Jennings was educated privately with the intention of entering his father's business. But deciding on a medical career he went for his medical training to St. Bartholomew's Hospital. Here he was a successful student, obtained the English double qualification in 1900, and took the degree of M.B. Lond. in 1901. Two years later he took, with honours, the degree of B.S., and at the same time he acquired the F.R.C.S. Eng. At St. Bartholomew's hospital he held a series of posts, being house surgeon, midwifery interne, and clinical assistant in the throat department, and for a time his intention to enter consulting ranks was suggested by his appointment as demonstrator of pathology in the hospital medical school. Here, as in his previous posts, he was quite successful, but he eventually turned to general practice and, apart from the war period, worked in Mayfair for 30 years, that is from 1904 onwards. During the war he was consulting physician to the Swedish War Hospital and also acted as surgeon specialist to the Queen Alexandra Military Hospital, Millbank.

A personal friend writes of him as follows:—"Jennings, known to a wide circle of friends as 'Fred,' was an extremely popular man as well as capable physician. He had the confidence of his numerous patients and deserved it, so alert was his intelligence; his reputation gained with his experience of 30 years, and while rarely at a loss over a case his own great equipment helped him to see when he needed other counsel. Then his range of personal friendship in the profession enabled him to get into touch with right opinions when further advice was needed. All those who knew him felt that he might have achieved high honour in specialist ranks, but they could see that in his preference for general practice he had found the right field for his talents. His deep, reassuring voice, his unfailing good humour, his gifts as a raconteur, and his obvious enjoyment of London life, were of value to him and his patients in the daily round—they helped to complete their trust and confidence. A regular visitor to Covent Garden and an enthusiastic golfer, usually at Walton Heath, he added in both places to a vast list of friends and acquaintances. He will be much missed in the sick-room, in the club house, and at the dinner-table; his big personality has left its mark."

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED JUNE 30TH, 1934

Notifications.—The following cases of infectious disease were notified during the week: Small-pox, 1 (last week 2); scarlet fever, 2289; diphtheria, 1115; enteric fever, 20; acute pneumonia (primary or influenzal), 676; puerperal fever, 30; puerperal pyrexia, 79; cerebro-spinal fever, 31; acute poliomyelitis, 6; acute polio-encephalitis, 2; encephalitis lethargica, 15; dysentery, 6; ophthalmia neonatorum, 102. No case of cholera, plague, or typhus fever was notified during the week.

The number of cases in the Infectious Hospitals of the London County Council on July 9th–10th was as follows: Small-pox, 1 under treatment, 0 under observation (last week 3 and 1 respectively); scarlet fever, 1593; diphtheria, 1594; measles, 1224 (last week 1331); whooping-cough, 293; puerperal fever, 26 mothers (plus 9 babies); encephalitis lethargica, 268; poliomyelitis, 2; "other diseases," 201. At St. Margaret's Hospital there were 11 babies (plus 7 mothers) with ophthalmia neonatorum.

Deaths.—In 121 great towns, including London, there were no deaths from small-pox, 2 (0) from enteric fever, 23 (7) from measles, 3 (1) from scarlet fever, 25 (5) from whooping-cough, 50 (8) from diphtheria, 47 (13) from diarrhœa and enteritis under two years, and 21 (1) from influenza. The figures in parentheses are those for London itself.

Of the deaths from measles 3 were in Stoke-on-Trent; Oldham and Bristol each reported 3 from whooping-cough. Diphtheria caused 6 deaths in Liverpool, 4 each in Manchester and Warrington, and 3 in Leeds. Of the deaths from diarrhœa and enteritis under 2 years, 6 were in Birmingham and 5 in Manchester.

The number of stillbirths notified during the week was 321 (corresponding to a rate of 47 per 1000 total births), including 41 in London.

PARLIAMENTARY INTELLIGENCE

NOTES ON CURRENT TOPICS

Public Health Services

ON July 3rd the House of Commons went into Committee of Supply on the Civil Estimates, 1934. Captain BOURNE (Deputy Chairman of Committees) was in the chair.

The debate was resumed on a Vote of £13,639,924 for the salaries and expenses of the Ministry of Health.

Mr. RHYS DAVIES moved to reduce the vote by £100. He said that all over the country the medical profession were doing excellent work in the conquest of disease, but the Minister of Health did not make any reference to cancer, rheumatism, or nervous disorder. With reference to national health insurance it was perhaps known to hon. Members that within the scheme there was a regional medical staff, and also a Dental Benefit Council. He understood that the Ministry of Health was working on a scheme to provide that the insured population should also receive their rights in connexion with optical benefit. He would be glad if the Minister could say something about the new Optical Council which he believed was about to be formed to see that optical benefit was properly administered. He also asked the policy of the Ministry in relation to the provision of more maternity homes. There had been a regrettable reduction of £500 in the provision for the training of midwives and health visitors, which was £26,500 in 1934. He asked whether a successor was to be appointed to Dame Janet Campbell, who had done excellent service for the health of the community, and if so when the new appointment would be made, and whether the circular to local authorities pointing out the directions in which the development of their services were still required, particularly in areas where the rate of maternal mortality was highest, had yet been issued?

Mr. PICKERING said that even if the slum clearance problem was proceeded with at the rate anticipated by the Minister of Health, and some 200,000 slum dwellings were cleared away and replaced by a corresponding number of good houses in the next five years, nevertheless the actual housing problem would not have been advanced any further because there would still remain an enormous shortage of "C" class dwellings which the poorest paid workers could rent at figures which they could afford to pay.

Mr. WEST said he shared the optimism of the Minister in regard to the great improvement in the health of the country, but there were still many black spots to be found in England, and he referred particularly to such places as North Kensington, where the infantile death-rate was nearly three times as high as that in South Kensington.

Sir FRANCIS FREMANTLE said that those who were concerned in the study of cancer were generally of the opinion, though they were not unanimous—that would not become the medical profession—that there was no real increase, age for age, and like for like, in the incidence of cancer at the present time. It was quite clear that there was a change going on in the age-distribution of the population. A greater proportion of old people in the population meant that diseases of old age became more prominent per 1000 of the population. Cancer being a disease of those between 40 and 70, it had a larger prey, and the figures were increasing; but as far as they could make out from the figures in any one area under like circumstances the total affected between 40 and 70 was fairly stationary. But the outlook was hopeful, mainly because of the encouragement being given to research.

The same thing applied to a certain extent to the increase of rheumatism. The incidence of nervous disease and mental deficiency had in the past been marked by the fact that such disorders were regarded as having a stigma attached, and had been concealed. But when they got down to the problem and found that there was some reasonable prospect of treatment for nervous disorders, they were able by ascertainment to increase the apparent incidence of these disorders.

One of the most important subjects was infant mortality. There had been a constant decrease in the figures of mortality, from 153 per thousand 73 years ago to 62 per thousand last year. Comparing the infant mortality at the beginning of the century with that to-day, the Minister had saved something like 40,000 lives in the year. This drop in infant mortality applied not only to infancy but continued through the second, third, fourth, and fifth years of childhood. It was the present principal medical officer of the Ministry of Health who first drew the attention of medical officers generally to the fact that there was this blank in the public health. Whereas 35 per 1000 died in their second year before the war, the figure had now been reduced to 14; in the third year it had fallen from 14 to 6 per 1000; in the fourth year from 9 to 4 per 1000; and in the fifth year from 6 to 3 per 1000. It was remarkable how much the ordinary mother was learning to-day, and that result had been achieved largely through the activity of health visitors.

Maternal mortality was a pressing and difficult problem. In 1912 there were 3492 maternal deaths, which in 1932 had been reduced to 2587, but the rate per 1000 births had not gone down. It was under 4 before the war, and it was now nearly 4¼. Those in touch with the work of midwives and district nurses in rural areas could not fail to be struck with the contrast between the general rate and the rate among those cases which were conducted by the midwives. In the last two centuries in this country we had rather departed from the system which still existed in many other countries, under which confinements were primarily the work of the midwife and not of the doctor. He hoped they were coming back to the system in this country, and that they would be able to get a body of properly trained midwives to conduct midwifery work, leaving the medical profession to be brought in for consultative purposes, or in the case of need, for the support and instruction of the midwife. But if that was to be the case the midwives would require to be trained for the purpose. More attention would have to be paid both to their original training and to their post-graduate training than was the case at present. Whereas the rate for the whole country was 4¼ per 1000 births, in the cases dealt with by the Queen's Institute of District Nursing for the same year the rate was 2·1. There were several reasons for the difference. One was that mothers who were having their first confinement did not take risks and very often went into hospital, while complicated cases were not treated by the midwives. These cases got into the hands of the doctors sooner or later and therefore the figures did not afford a fair comparison as to the efficiency of one method or the other. But the fact remained that there was this comparatively low rate among the cases dealt with by the district midwives as compared with the figures for the whole country. There was, however, a slight increase also in their figures. One of the difficulties among mothers to-day was a question of diet; another was the shape of the pelvis. According to the departmental report on maternal mortality the shape was more adapted to easy childbirth in Dutch than in British women. He believed that training and exercises in early life might lead to improvement in that direction. Many cases—over one-third, he thought—were traced to puerperal infection, which often arose through the use of instruments in a hurry, and the desire to hasten the natural process.

Sir FRANCIS further asked whether the Mental Treatment Act, 1930, had not had the effect which was hoped for in encouraging patients to submit themselves voluntarily for treatment at a mental hospital. He was inclined to think there was too

much officialdom. They could get voluntary treatment in incipient mental disease only by making it as easy and unofficial as possible. He also asked whether the Registration of Nursing Homes Act, 1927, had improved the working of those homes, and had led to the closing of unsatisfactory homes? Had it stopped undue profiteering and prevented fraud?

They saw the figures for tuberculosis with heavy minds after all the money that had been spent. In 1932 tuberculosis patients who died or were discharged from approved residential institutions numbered 39,000. Of these 500 died in institutions, nearly 9000 were discharged quiescent, and 24,000 were discharged not quiescent. The 24,000 discharged not quiescent went back to their homes, which were very likely overcrowded and in the slums, and they were spreading the disease among other people. After two, three, or five years they died, and all the work which had been put into sanatorium and dispensary work was wasted. Places such as Preston Hall in Kent or Papworth in Cambridgeshire gave much hope and encouragement, but were limited to a very small number. Could not some of the money which was to be devoted to slum clearance and rehousing be used for rehousing in village settlements like Papworth? He could not help thinking that by some coöperation between the Unemployment Board and the Ministry of Health there might be some hope of giving employment in training centres to unemployed people who were tuberculous.

Mr. SHAKESPEARE (Parliamentary Secretary to the Ministry of Health), replying to the debate, said that in regard to the drought and the urban water-supply the Ministry on the whole were looking forward with confidence to the future, always provided that the consumers could be relied upon to coöperate in reasonable economies. The Rural Water Supplies Act was helping to solve the permanent problem in the rural areas. In the two and a half months since the Act was passed they had had applications from 593 parishes in respect of capital works totalling £1,700,000. They had approved for grant water schemes in respect of 211 parishes amounting to a total capital of £700,000. That was twice the total of the last two years, and it was approaching the maximum figure ever reached under the predecessors of the present Minister of Health. He claimed that at that rate the permanent problem of water-supplies in rural areas would be very greatly alleviated. In view of an alarming article in the press alleging that there was an outbreak of scarlet fever and diphtheria, and that these diseases were everywhere increasing, he had sent for the best expert in the country. He had pointed out that scarlet fever and diphtheria were not diseases that were connected with absence of water, but that on the contrary those diseases came in cycles of four years or five years and that more often than not they occurred in areas where the water-supply was satisfactory. To sum up the water situation, he could say that by legislation, by administrative action, inspection, and conference they had been able to render great assistance to local authorities in the matter of the drought. Very much of what Mr. West had said about overcrowding causing disease and infant mortality could not be denied, and for that reason the Government were bringing in a Bill which particularly would apply to those troublesome aspects of the problem. The Minister of Health in his slum clearance crusade was in the next five years putting at the disposal of local authorities for finding accommodation for the poorer paid workers 300,000 houses at a cheaper rent than anything which had been hitherto provided, and in connexion with the new overcrowding Bill that policy would be continued and the local authorities under subsidy where necessary would cater for the poorer paid workers. The machinery of slum clearance had started working and was gaining pace. At the end of the year he hoped they would be able to improve even on the present figures.

Wing-Commander JAMES said he regretted that in view of the unanimous report of the Departmental Committee on Sterilisation of Mental Defectives the Government had not found it possible to implement that report or to hold out any immediate prospect that they were going to do so. He would like to ask what steps were being taken to carry out the recommendations in respect of research that were made in Chapter 7 of the report.

Dr. O'DONOVAN said that surely it was selfishness to want to raise their own standard of living by mutilating the bodily integrity of those who were admittedly their weaker brothers. People classed as mental defectives belonged to a class which the medical profession found the utmost difficulty in labelling. In the medical press there were many articles pointing out that many so-called mental defectives were in fact dullards. Any breach of the affection and trust which existed between patient and doctor would be to the greatest disadvantage to the calling of medicine. Another difficulty would arise in public life and in hospitals if administrators insisted on sterilisation as being good for the State, while doctors and nurses for professional and conscientious reasons differed from such conclusions.

After further debate,

Sir HILTON YOUNG (Minister of Health) said that with the assistance of the approved societies and his advisers he had constantly sought for means of relieving the position in regard to arrears under National Health Insurance. They had taken measure after measure for that relief, and it had been very effective. In order to simplify the matter and to assist the position of those who were now falling into arrears they had now succeeded in arranging that the reduction of arrears of contributions from 1*s.* 6*d.* to 9*d.* should apply to all those who, owing to unemployment, were falling into arrears. That was a very big concession indeed, and one which they were told by the approved societies would make a very great alleviation of the situation for the unemployed. In regard to maternal mortality, it was the intention of the Ministry to press ahead with the development of the service for the sake of mother and child. They would not be content until these services in every part of the country were as good as they were in the best equipped towns. He proposed at the proper time to renew the measures for stimulating efforts of this sort by a direct message to local authorities. If the methods they were adopting did not succeed they must proceed to others.

The motion to reduce the vote was rejected by 173 votes to 39.

Scottish Poor-law

In the House of Commons on July 5th the Poor-Law (Scotland) Bill as amended in Standing Committee was considered.

The measure was recommitted in order that several amendments might be discussed which could not be discussed on the Report stage.

Mr. BUCHANAN moved an amendment to Clause 11 (Outdoor relief to members of friendly societies, &c.) to ensure that in affording outdoor relief to any person a local authority should disregard the first 5*s.* of his sick pay from a trade union, as well as from a friendly society.

Mr. SKELTON (Under-Secretary for Scotland) accepted the amendment, which was agreed to.

Mr. N. MACLEAN moved the first of three amendments to ensure that the local authority in assessing or allocating relief should disregard maternity benefit, any weekly payment by way of compensation under the enactment relating to workmen's compensation, and any pension under the Blind Persons Act 1920, and any other income by virtue of the provisions of that Act or from any charity for the blind.

After some debate,

Mr. SKELTON said that this was a case where he could not give a concession. In Scotland all the local authorities except two had special schemes whereby assistance to destitute blind was not given by way of public assistance but under the Blind Persons Pensions Act. He proposed to take the matter up

with the two authorities to whom he had referred, and ask them to come into line with the rest of Scotland. The Government were not prepared to remove from local authorities the discretion to disregard half the amount of workmen's compensation an applicant received. With regard to maternity benefit his information was that it was generally disregarded.

At a later stage,

Mr. SKELTON announced that having been impressed with the debate he would accept the amendment in respect of maternity benefit, but on the distinct understanding that it should be redrafted when the Bill reached the House of Lords.

The amendment was agreed to.

Mr. MACLEAN then formally moved the amendment relating to payments by way of compensation, this being negatived by 183 votes to 48.

The amendment dealing with pensions under the Blind Persons Act 1920 or from any charity for the blind, also formally moved, was negatived by 190 votes to 34.

The Bill passed through the report stage and was read the third time by 143 votes to 29.

Road Traffic Bill

In the House of Lords on July 10th the Road Traffic Bill (which has passed through the House of Commons) was read a second time.

HOUSE OF COMMONS

WEDNESDAY, JULY 4TH

Safety Glass in Public Service Vehicles

Mr. HOLFORD KNIGHT asked the Minister of Transport whether, in the interests of public safety, he would make it compulsory for all public vehicles to be equipped throughout with safety glass.—Mr. HORE-BELISHA replied: Since Jan. 1st, 1932, the regulations have required, as regards new vehicles, that all glass fitted to windscreens or windows facing to the front on the outside of any motor vehicle, except glass fitted to the upper deck of a double-decked vehicle, shall be safety glass. As at present advised, I do not think it necessary to make the use of such glass throughout public service vehicles compulsory.

Replying to a further question by Mr. Knight, Mr. Hore-Belisha said that he would be ready to give further consideration to any suggestion.

Air Attack with Disease Germs

Sir NICHOLAS GRATTAN-DOYLE asked the Prime Minister whether he was aware that evidence existed that experiments were being made and secret German plans perfected by the Luft-gas-angriff department for the destruction of human beings in war by aircraft carrying deadly disease germs; that experiments had been made concerning the vulnerability of underground railways in London and Paris; whether he had considered the evidence; and what action, if any, he proposed to take.—Mr. BALDWIN replied: I have seen allegations to this effect in a published article. They have been officially denied by the German Government. The question of the vulnerability of the underground railways in London is kept under constant observation as part of the general question of air raids precautions, but I do not consider it in the public interest to make any further statement.

THURSDAY, JULY 5TH

Coroners' Jurisdiction and Disposal of Bodies

Mr. LAWSON asked the Home Secretary whether he was aware that considerable distress was caused to relatives of persons fatally injured just within the boundaries of one coroner's jurisdiction while their homes were in another; that the bodies sometimes lay for two or three days in the mortuary before being conveyed to the homes of relatives; and whether he could take steps to avoid the unnecessary pain arising from this practice.—Sir JOHN GILMOUR replied: Section 14 of the Coroners Amendment Act of 1926 empowers a coroner to issue a burial order at any time after he has viewed the body, and I have no doubt that coroners generally are ready to avail themselves of this power in proper cases.

Mr. LAWSON: In view of the very bad case that I brought to the right hon. gentleman's attention where a man's body was brought from the pit to Gateshead, just over the border, and then was taken away by a policeman, cannot the right hon. gentleman do something to modify the position in cases where there are two areas of jurisdiction?

Sir J. GILMOUR: I understand that in the case referred to the body was removed before the coroner had an opportunity of going into the matter. It is essential that the coroner should give an order.

Mr. LAWSON: Is the Home Secretary not aware that the bodies are removed immediately from the pit to their homes, but in this case it was simply a case of the coroner's fees, I understand?

Sir J. GILMOUR: I am very anxious, of course, to obviate any kind of unpleasantness in dealing with this problem, but it is essential from the point of view of the coroner that the removal of the body should not take place before he gives the order.

Captain HAROLD BALFOUR: In view of the unsatisfactory nature of this particular case, and the general unsatisfactory working in the case of fatal injuries and seriously injured persons on the roads, would my right hon. friend consider setting up a departmental committee in order to find out how far overlapping exists, and to try to straighten out the present unsatisfactory condition of things?

Sir J. GILMOUR: I am prepared to consider the whole matter. I cannot commit myself to what action I shall take.

State Medical Service

Mr. LLEWELLYN-JONES asked the Minister of Health whether he was aware of the movement both in the medical profession and also amongst friendly societies and national health insurance organisations in support of the setting up of a complete medical service for the whole of the population of the country; and whether he would favourably consider the appointment either of a parliamentary or of a departmental committee to explore the situation and to report as to the desirability of introducing legislation for the creation of such a service.—Sir HILTON YOUNG replied: Proposals on this subject have been brought to my notice and are being examined, but I am not at present in a position to indicate what action, if any, the Government may decide to take in relation to them.

Imports of Processed Milks

Sir PERCY HURD asked the Minister of Agriculture what arrangements had been made for the regulation of imports of processed milks after June 30th.—Mr. ELLIOT replied: The Governments of the foreign countries mainly concerned in the United Kingdom market for condensed milk, milk powder, and cream have been asked to arrange for the following reductions in supplies as from July 1st, the reductions in each case being based on imports during the corresponding months of the year previous to the introduction of the voluntary import regulation arrangements—namely, June, 1932–May, 1933:—

Condensed Skimmed Milk.—Continuance for the time being of the reduction of 22½ per cent.

Condensed Whole Milk and Milk Powder.—Continuance for the time being of the reduction of 20 per cent.

Cream.—Reduction of 33⅓ per cent. for the quarter ending Sept. 30th.

The Governments of the Commonwealth of Australia and of the Dominions of Canada and New Zealand have been asked to continue during the quarter ending Sept. 30th the coöperation which they have been good enough to afford since the regulation of imports of processed milks was first introduced. Arrangements are also being made to secure reductions in imports of condensed whole and skimmed milk and cream from the Irish Free State. It will be appreciated that, since the bulk of our imports of processed milks, other than cream, from foreign countries is supplied by the Netherlands, the position as regards import regulation is for the time being governed by the agreement recently concluded for the maintenance of the status quo in trade relations between the United

Kingdom and the Netherlands, pending the negotiations of a trade agreement.

Rehousing and Slum Clearance

Mr. CHORLTON asked the Minister of Health if he was now able to announce the names of the members he had appointed to deal with the question of buildings involved in rehousing after slum clearance.—Mr. SHAKESPEARE, Parliamentary Secretary to the Ministry of Health, replied: The members of the committee will be:—Mr. Ewart S. Andrews, B.Sc., M.Inst.C.E., M.I.Struct.E.; Mr. Henry V. Ashley, F.R.I.B.A.; Mr. Oscar Faber, O.B.E., D.Sc., M.Inst.C.E., M.I.Struct.E.; Mr. George Topham Forrest, F.R.I.B.A.; Mr. Ian B. M. Hamilton, B.A., A.R.I.B.A.; Sir George W. Humphreys, M.Inst.C.E.; Mr. B. L. Hurst, M.Inst.C.E., M.I.Mech.E.; Mr. L. H. Keay, O.B.E., F.R.I.B.A.; Mr. Francis Lorne, F.R.I.B.A.; Mr. J. A. Macintyre, O.B.E., B.Sc., M.Inst. C.E.; Mr. R. Travers Morgan, M.Eng., M.Inst.C.E., A.M.I.Mech.E., M.I.Struct.E.; Mr. Stanley C. Ramsey, F.R.I.B.A.; Mr. A. Scott, M.B.E., F.R.I.B.A., M.I.Struct.E.; Mr. W. L. Scott, M.Inst.C.E.; Mr. R. E. Stradling, M.C., D.Sc., Ph.D., M.Inst.C.E.; and Mr. J. Wilson, F.R.I.B.A., F.R.S.E. Sir George Humphreys will be chairman, and Mr. A. Zaiman, whose services have been lent by the Department of Scientific and Industrial Research, will be secretary of the committee.

Medical Practitioners and Motor Accidents

Mr. TEMPLE MORRIS asked the Minister of Transport whether, in view of the proposed mulcting of a motorist of 12*s.* 6*d.* for the fee of a doctor when his car had been in collision with anyone, he could state whether the doctor in each case would be summoned by the parties to the accident or by the police, or whether it was intended that any individual should have the right to communicate with a medical man.—Captain A. HUDSON, Lord of the Treasury, replied: The circumstances of accidents vary greatly, and a hard-and-fast rule as to who has the right to summon medical assistance would be likely to involve dangerous delays.

Medical Research

Sir ROBERT GOWER asked the Secretary to the Treasury what sum had been devoted by the State this year to the promotion of medical research and what sum had been similarly applied during the last eight years.—Mr. DUFF COOPER replied: The annual grant in aid of the Medical Research Council was £135,000 from 1925 to 1927 inclusive, £140,000 from 1928 to 1931 inclusive, and £139,000 in 1932 and 1933. Provision for a grant of £139,000 is included in the estimates for the current financial year. There are other contributions made by the State to medical research, but, apart from a grant of £100,000 in 1929 for the purchase of radium, it is not possible to give figures. Inclusive grants are paid to a number of universities out of which considerable sums are allocated by the University authorities to their medical schools, which include medical research among their activities, but it is not possible to distinguish the amounts applied to this purpose. In addition, medical researches are undertaken from time to time by the Ministry of Health and other Government departments.

Silicosis in South Wales

Dr. JOHN WILLIAMS asked the Secretary for Mines the number of men certified for silicosis in the county of Carmarthen and in the rest of the South Wales coalfield; and the number of such cases where death had resulted from this disease.—Mr. ERNEST BROWN: I am informed by the Home Office that between June 1st, 1931, when the Medical Board under the compensation scheme was appointed, and May 31st, 1934, 105 miners were certified by the Board as disabled from silicosis in the county of Carmarthen and 279 in the remainder of the South Wales coalfield; and that the number of deaths certified by the Board were 26 and 57 respectively.

MEDICAL NEWS

Royal College of Surgeons of England

Election to the Council.—On July 5th four Fellows were elected into the council to fill the vacancies occasioned by the retirement in rotation of Mr. Ernest W. Hey Groves, Mr. G. Grey Turner, and Mr. Hugh Lett, and by the death of Mr. R. P. Rowlands. The result of the poll was as follows:—

	Votes.	Plumpers.
George Grey Turner (Newcastle) ..	903	6
Ernest William Hey Groves (Bristol)	841	3
Hugh Lett (London)	734	43
William Girling Ball (St. Bart.'s) ..	584	61
Ernest Cranmer Hughes	445	27
Alfred William Sheen	298	6
Duncan Campbell Lloyd Fitzwilliams	240	10
Gwynne Evan Owen Williams ..	210	13

In all 1995 Fellows voted, including 210 Fellows resident out of Great Britain and Ireland; in addition, 9 votes were found to be invalid, and 2 were received too late. Mr. Girling Ball becomes substitute member of council for the late Mr. Rowlands until 1938.

University of Oxford

The Theodore Williams Scholarship in Anatomy is to be divided between D. L. P. de Courcy and L. L. Whytehead; the Theodore Williams Scholarship in Pathology has been given to D. F. G. Moir. The master and fellows of University College have awarded the Radcliffe Scholarship in Pharmacology to H. M. Sinclair.

University of Leeds

On July 3rd the honorary degree of D.Sc. was conferred on Dr. Joseph S. Bolton, medical director of the West Riding Mental Hospital, and until recently professor of mental diseases at Leeds University, and Sir Robert Muir, F.R.S., professor of pathology in the University of Glasgow.

University of London

At a meeting of the court held on July 4th tenders from seven selected firms for the superstructure of the first of the buildings to be erected on the University's site in Bloomsbury were considered. The lowest tender received—namely, that of £362,579—was accepted. A condition of the contract will be the use throughout of materials obtained from sources within the British Empire. The contract will provide for the building of the senate house and administrative offices, a portion of the University library, and certain works connected with the hall.

The Kent county council has made a grant of £40,000, payable over ten years, towards the cost of the new University buildings.

University of Manchester

At recent examinations the following candidates were successful:—

M.D.

C. N. Aldred, Marguerite E. Cliffe, Benjamin Dunkerley, E. A. Gerrard (with commendation), E. R. W. Gilmore, J. M. Greenwood, E. F. Hill (gold medal), Geoffrey Lapage, W. H. Newton (with commendation), Gerald Ramage, and B. R. Sandiford.

CH.M.

W. B. McKelvie.

FINAL EXAMINATION FOR M.B. AND CH.B.

D. H. Mackay (second-class honours), Harry Baker, Monica D Boyle, A. S. Bullough, W. P. Cargill, Neville Copeland, J. D. H. Cran, D. D. Cranna, Annie M. Dawson, I. H. Flack, Norman Goldstone, Harry Harris, Eileen M. Hughes, Fred Janus, N. F. Kirkman, Amy B. de V. Mather, G. H. Moore, E. L. Patterson, Ralph Spencer, and J. A. A. L. Woodhead.

Part I.—Monica D. Boyle, John Charnley, Eleanor B. Clarke, Mary A. C. Cowell, T. F. Davey, F. P. Ellis, William Fielding, F. I. Firth, Samuel Franks, Eric Greenhalgh, G. D. Harthan, E. H. Heilpern, K. H. Higson, A. D. Hoffmann, L. L. Husdan, J. I. A. Jamieson, W. E. Kershaw, A. F. Mackay, Ralph Mallinson, J. L. Morgan, Annie Nelstrop, R. L. Parish, C. S. Parker, J. N. Parker, G. R. Rhodes, Leslie Margaret Ross, Cyril Royle, H. L. Settle, J. N. Shepherd, Dennis Shute, Roland Thornley, H. J. Wade, J. R. Wardley, and Margaret I. Williams.

University of Manchester

Dr. C. P. Lapage, lecturer in diseases of children, has been appointed to a university readership. Dr. J. F. Hoslop and Dr. Eric Vernon have been appointed demonstrators in anatomy.

University of Edinburgh

On June 28th the degree of D.Sc. was conferred on Dr. S. A. Kinnier Wilson.

University of Dublin

Dr. William Robert Fearon, Fellow of Trinity College, Dublin, and hitherto lecturer in biochemistry in the University, has been appointed professor of biochemistry. Dr. David Smyth Torrens, hitherto lecturer in histology, becomes assistant professor of physiology.

University of Aberdeen

On July 9th the following degrees were conferred:—

M.D.

***T. N. Morgan, ***Ann L. Thomson, **Alexander Cruickshank, **J. R. M. Mackie, *A. G. Badenoch, *Roderick Mackay, Edward Farquharson, T. A. Fraser, W. H. Harris, A. W. Henderson, Catherine I. A. Jamieson-Craig, and Mary Riddoch.

*** With highest honours; ** with honours; * with commendation.

M.B., CH.B.

C. Ludwig (with second-class honours); E. P. Adel, A. J. Beddie, Hugh Burnett, J. R. Byars, John Cameron, Edward Cay, E. M. Darnley, I. K. Ettman, Jane R. Forgie, Charles Glassman, J. F. R. Goodlad, J. T. Grassie, David Horn, I. R. Horn, R. A. Horne, P. W. Ingram, M. H. Kirsner, A. H. Lasdon, L. A. Ledingham, A. P. Macdonald, J. C. McGregor, D. A. M. MacLennan, J. H. S. Morgan, A. F. T. Ord, Gilbert Parker, J. R. M. Sangster, I. M. Schnee, J. A. Shearer, Isadore Shechner, S. R. N. Smith, E. J. Strachan, J. W. M. Sutherland, and A. H. Weiner.

D.P.H.

A. G. Badenoch, Douglas Bell, Alexandra H. Duthie, and J. B. Ewen.

University of Birmingham

Dr. P. C. P. Cloake, honorary physician to the Queen's Hospital and to the Birmingham and Midland Hospital for Nervous Diseases, Birmingham, has been appointed professor of medicine in the university in succession to Prof. J. G. Emanuel.

Dr. Cloake qualified in 1915 afterwards serving in the Royal Army Medical Corps. In 1921 he graduated M.B. in the University of London and in 1923 obtained the university medal for his M.D. thesis. In 1924 he became a member of the Royal College of Physicians of London, and he has also obtained diplomas in public health and psychological medicine. Dr. Cloake served on the staff of the Ministry of National Service and Ministry of Pensions in Cambridge and in 1920 became deputy commissioner of medical services. During this time he acted as lecturer at Cambridge University and as honorary physician to the psychological department of Addenbrooke's Hospital. He returned to London on his appointment as registrar to the Hospital for Nervous Diseases at Maida Vale and became an assistant physician to the Metropolitan Hospital. In March, 1925, he went to Birmingham as assistant physician to the Queen's Hospital. He has held a research grant for work on organic nervous diseases in London and Birmingham and is the author of one of the special reports of the Food Investigation Board. His other contributions to medical literature include discussions of the mental sequelæ of encephalitis lethargica, and the influence of the diencephalon on metabolism.

Applications are invited for the appointment of reader in industrial hygiene and medicine, and should reach the secretary of the University not later than Sept. 1st. The decision of the University to establish a new department for teaching and research in this subject was reported in our issue of April 28th (p. 927). Particulars of the appointment are given in our advertisement columns this week.

West London Medico-Chirurgical Society

On July 4th the president and Mrs. H. Tyrrell-Gray received the guests at the society's fifty-second annual dinner, held at the Trocadero Restaurant. As soon as everyone was seated, Sir Alfred Rice-Oxley rose to present a loving cup and chain purchased for the society with a legacy from Dr. Rickard Lloyd, a member of long standing who died early last year. The cup shows the names of 52 presidents, including Sir Alfred, and the chain embodies the badge of the society, presented by Charles Keetley. After dinner Lord Macmillan proposed the toast of president and society. Speaking of the value of professional gathering, he quoted the saying that "a rut differs from the grave in being a little narrower." Doctors were fortunate in their profession, for the term "beloved physician" had an almost canonical flavour; but who had ever heard of a "beloved solicitor"? After referring to his unmeasured admiration for the work done, especially in hospitals, by medical men, and particularly of Mr. Tyrrell-Gray's services at Great Ormond-street, Lord Macmillan concluded with an appeal for medical support for the University of London. In response, Mr. Tyrrell-Gray spoke very modestly of his own achievements and very warmly of his guests and fellow officers. Dr. F. J. McCann, in proposing the guests, described how Lord Macmillan, an LL.D. of seven universities, had served as chairman of the Royal Commission on Lunacy and then had been appointed to preside over the Pharmacopœia Commission. Sir Stanley Jackson, as Governor of Bengal, had proved his ability to stand up to bullets as well as bowling, and as chairman of the Test selection committee had brought good fortune to this country. Sir Stanley remarked that he found the compliments refreshing, for bouquets were by no means thick upon the ground. Mr. Warren Low, president of the Royal Society of Medicine, said that his society had now more than 5000 fellows and 170,000 books in its library. But size was not everything. He recalled a conversation between a bishop and a shepherd who said he had 500 sheep. "Ah," said the bishop, "I too am a shepherd but count my flock in tens of thousands." "Mon," said the shepherd, "that must be an awful responsibility in the lambing season."

Association of Surgeons of Great Britain & Ireland

A surgical scholarship of the value of £350 will be awarded in November by the association to a candidate who wishes to pursue a definite line of research or to study surgery in specified clinics either at home or abroad. Further particulars will be found in our advertisement columns. The honorary secretary of the association is Mr. Julian Taylor, 65, Portland-place, London, W. 1.

British Social Hygiene Council

This council, acting with the Conference of British Missionary Societies, has organised a conference on official and non-official coöperative action in combating traffic in women as suggested by the League of Nations inquiry in the East. The conference will be held in the London School of Hygiene and Tropical Medicine, Keppel-street, W.C., on Wednesday, July 25th. Lord Lytton, the chairman, will open the morning session at 10 A.M.

North Devon Isolation Hospital

A joint isolation hospital, serving nine contributory authorities, all in North Devon, has been opened. The building, which has cost £17,000, has accommodation for 30 patients.

Naval Sick Berth Staff

At a meeting recently held under the presidency of Surgeon Vice-Admiral Sir Reginald Bond, a central council of the Royal Naval Sick Berth Staff Associations at Portsmouth, Plymouth and Chatham was formed under the patronage of Admiral of the Fleet, Sir Roger Keyes. These associations seek to provide death and invaliding benefits for the sick berth staff, and to assist them in obtaining employment on discharge from the Service. Each will still manage its own financial affairs, but with the assistance of a central council it is considered that the employment question will be more forcibly brought to the notice of the medical and general public. The royal naval sick berth staff are trained men who act as nurses in the royal naval hospitals, and on ships in the Navy. They have to pass examinations for promotion, and are discharged to pension after 22 years' service. They have considerable experience in responsible positions. Many have qualified as masseurs, radiographic, laboratory, electro-therapeutic, and operating theatre assistants. All have experience in dispensing, and store-keeping, as well as surgical, medical and mental nursing, and are said to be qualified to fill various situations in hospitals, clinics, institutions as surgical assistants, or as assistants to medical men. Surgeon Vice-Admiral R. W. B. Hall, medical director-general, is a vice patron, while Sir Reginald Bond is the president of the council. Surgeon-Captain Montague Knapp, c/o Medical Department, Admiralty, London, S.W. 1, is the representative president who will be glad to furnish any further information.

There will be a meeting at the Mansion House, London, under the presidency of the Lord Mayor, on Wednesday, July 18th, at 4 P.M., when the Duchess of Atholl and Sir John Martin Harvey will speak on behalf of the Robert Jones National Memorial. The Lord Mayor will be supported by Mr. Rudyard Kipling and Lord Moynihan.

The American Association for the Study of Goitre has awarded to Mrs. M. A. B. Brazier, Ph.D., B.Sc., the Van Meter prize of $300 for the essay entitled the Impedance Angle Test for Thyrotoxicosis. A leading article on the Measuring of Thyroid Dysfunction, using Mrs. Brazier's method as a text, will be found in THE LANCET of Sept. 30th, 1933, where her work was first published. A later paper by Dr. Brazier and Dr. F. M Grant appeared in our issue of Jan. 20th of this year.

Morland Clinics, Alton

On July 7th, at a garden fete held at Morland Hall in aid of the Morland Hall cot fund at the Treloar Cripples' Hospital, Lady Radnor opened the new west wing of the clinics. It will be possible in the new wing to give natural sun treatment to the patients in their own rooms without the necessity of wheeling them onto the adjacent balcony. The Morland Hall cot is maintained by contributions of patients at the clinics and their friends.

Order of St. John of Jerusalem

The following promotions in and appointments to the Venerable Order of the Hospital of St. John of Jerusalem have been sanctioned by the King :—

As Knight of Justice.—Lord Moynihan and Dr. A. M. Ware.

As Knight of Grace.—Hon. J. H. King, M.D., Colonel H. A. Bruce, F.R.C.S., and Sir Frederick Norton Kay Menzies M.D.

As Commander.—Capt. R. J. Isaac, Dr. R. E. W. Wodehouse, Lord Horder, and Dr. W. Hutton.

As Officer.—Dr. F. B. G. Holmes, Dr. H. E. Gibbs, Dr. C. H. Tewsley, Major-General R. B. Ainsworth, Colonel R. C. Wilmot, Dr. W. D. Kirkwood, Colonel H. V. Prynne, Dr. G. Thornton, Dr. C. H. Francis-Williams, Dr. P. R. Bolus, Dr. G. B. Peat, Major W. Nunan, Dr. R. L. E. Downer, Dr. A. Heys, Dr. F. O'B. Ellison, Dr. W. N. West-Watson, and Dr. Phyllys P. Pigott.

As Associate Officer.—Dr. Dhanjibhai Hormasji Mehta.

As Serving Brother.—Dr. H. J. Slane, Dr. G. L. Pierce, Dr. S. B. Turner, and Dr. E. P. Dickin.

Dr. Bernard Hollander Memorial Meeting

At a meeting held on June 12th, at Essex Hall, London, Dr. H. J. Norman, speaking of the medical side of Dr. Hollander's activities, recalled his remarkable erudition and the fact that he seemed to require less than the ordinary amount of sleep. The result was that he was able to undertake much literary work, in addition to attending to a very busy practice as a mental specialist. Mr. J. P. Gilmour and Mrs. Stackpool O'Dell spoke of Dr. Hollander's work in connexion respectively with rationalism and phrenology. A resolution was carried to the effect that a Bernard Hollander Memorial should be established, and a preliminary committee was formed to this end.

International Congress of Radiology

The fourth International Congress of Radiology will take place at Zurich, Switzerland, from July 24th to 31st. At the opening meeting the methods adopted by different countries in their campaign against cancer will be reported on. In all about 400 lectures and reports will be given, and the greater part of them will deal with X ray diagnosis. The first Congress of Radiology was held in London, the second in Stockholm, and the third in Paris in 1931. Delegates from at least 30 countries will attend this year's congress, and the guests of honour will include Sir George Buchanan (president of the cancer commission of the League of Nations) and M. F. G. Boudreau (director of the health section of the League). During the congress latest technical equipment for radiology and electrical treatments will be exhibited.

Research on Tuberculosis

The Medical Research Council announce that they have made the following awards of Dorothy Temple Cross fellowships for 1934–35, under the terms of the benefaction in that name for research fellowships in tuberculosis: William Sayle Creer, M.B. Liverp., Lady Jones orthopædic research fellow in the University of Liverpool; Alfred White Franklin, M.B. Camb., M.R.C.P. Lond., chief assistant to the children's department at St. Bartholomew's Hospital; Philip D'Arcy Hart, M.D. Camb., M.R.C.P. Lond., assistant physician to University College Hospital; Arthur Landau, M.B. Capetown, M.R.C.P. Lond., house physician at the Brompton Hospital; Alastair Hamish Tearloch Robb-Smith, M.B. Lond., senior demonstrator of morbid anatomy at St. Bartholomew's Hospital. Dr. Robb-Smith's fellowship is tenable in Germany: the others at centres in the United States. The fellowship awarded last year to Dr. G. Gregory Kayne for work at centres in Europe has been renewed for a further period of six months.

The Royal College of Physicians of London invites applications for the Prophit scholarship from qualified medical practitioners with some experience of tuberculosis. The scholar will be responsible for the conduct of a survey into the incidence and progress of tuberculosis in selected sections of the community, by clinical examination and tuberculin testing, over a period of years. Further particulars will be found in our advertisement columns.

International Congress on Chronic Rheumatism

A congress was held at Aix-les-Bains from June 28th to July 1st, Prof. Fernand Bezançon presiding. Some 350 medical men attended, and official delegates were present from 20 countries. The subject discussed was rheumatoid arthritis, one day being devoted to pathology and ætiology, another to symptomatology and to clinical diagnosis, and another to therapeutics. Prof. Bezançon and Dr. Mathieu-Pierre Weil (Paris) described in detail the clinical picture originally presented by Charcot. Subsequent speakers, including Prof. Mouriquand (Lyons) and Prof. Roche (Geneva), discussed the relation of endocrine factors, infection, constitution, and the autonomic nervous system to the disease. Prof. F. Coste (Paris) reviewed the evidence on which the various theories of infection have been based, with special reference to the streptococcus, the gonococcus, and the tubercle bacillus. A great variety of different conditions was referred to under the title of rheumatoid arthritis, but the tendency of the speakers was to ascribe the clinical picture of this disease to the way in which the individual reacts to a variety of extraneous factors, rather than to a specific infection or metabolic upset. Dr. Francis Bach (London) emphasised the general decalcification of bone as one of the early pathological changes in rheumatoid arthritis. Dr. Gilbert Scott (London) described the bone changes visible in radiograms in cases of rheumatoid arthritis, and the diagnosis by this means from osteoarthritis, gout, and other conditions. Prof. Abrami (Paris) discussed the varied clinical forms of the disease, and Prof. Marañon (Madrid) its differential diagnosis. Dr. R. J. Weinsenbach (Paris) and Dr. F. Françon (Aix-les-Bains) spoke on prognosis, and Prof. Kahlmeter (Stockholm) on the changes in the blood found in this disease. In connexion with treatment Sir William Willcox outlined the part played by focal infection in the genesis of rheumatoid arthritis, and the technique of its treatment by vaccines. Prof. Rathery (Paris) dealt with drug treatment and chemotherapy, Prof. Gunzburg (Brussels) with physiotherapy, Prof. Paul Mathieu (Paris) and Dr. Loring T. Swaim (Boston) with orthopædic treatment, and Prof. Leriche (Strassburg) with the role of surgery. The latter stressed the value of parathyroidectomy in the treatment of rheumatoid arthritis, and discussed the indications for arterial sympathectomy and arthroplasty. During the congress the new thermal baths were open for inspection, and the various methods of physical treatment available at Aix-les-Bains were demonstrated. The success of the congress was largely due to the efforts of the secretaries, Dr. Mathieu-Pierre Weil, Dr. F. Françon, and Dr. J. F. Forestier.

British Industries House

On July 19th, at 3 P.M., Lord Derby will open the medical section of the new British Industries House, Marble Arch, London, W. The advisory council for this section consists of Dr. Alfred Cox, Mr. A. R. Melhuish, M.P.S., Sir Crisp English, and Dr. E. P. Poulton.

National Institute for the Blind

On July 6th the Prince of Wales opened the Eichholz Memorial Clinic and Institute of Massage and Physiotherapy by the Blind. Captain Sir Beachcroft Towse, chairman of the National Institute for the Blind in Great Portland-street, London, W., to which the clinic is attached, received the Prince and explained the work in progress. He said that in addition to the weekly newspaper published for the blind, 500,000 volumes in Braille and Moon type were issued each year, and financial help was given to many institutions who ministered to the needs of the blind. The new clinic would provide a centre for the treatment of patients, and also act as a clearing house for all blind persons practising massage. The institute was doing its best to help blind people to become self supporting and honourable citizens. In declaring the institute open the Prince assured Mr. William Eichholz, the donor of the clinic in memory of Dr. Alfred Eichholz, that his generosity was appreciated not only by the blind but by those also who could see. Lord Moynihan, chairman of the medical advisory board, proposed a vote of thanks to the Prince.

Florence Nightingale International Foundation

This institution was inaugurated last week at 15, Manchester-square, under the chairmanship of Sir Arthur Stanley, who explained that the purpose of the Foundation is to provide post-graduate education on a permanent basis for a selected group of fully trained professional nurses, drawn from those who stand in the forefront of the profession in all countries. He added that the Foundation would be governed by a grand council, comprising representatives of the International Council of Nurses, the League of Red Cross Societies, and the Nightingale Memorial Committees, formed, or to be formed, in each country to further the purposes of the Foundation. Eighteen such committees had already been constituted. The Foundation started its work at once and took over the international courses for nurses conducted in London until last year, under the auspices of the League of Red Cross Societies. During the last 12 months the courses had been carried on by a provisional committee. In handing over their task the committee had reported that arrangements for continuing the courses during the year 1934–35 had been made, and 20 nurses with suitable qualifications had been nominated to participate.

London Hospital Medical College

On Tuesday last Mr. Walter Elliot, M.B., Minister of Agriculture, distributed the prizes of the London Hospital medical college and dental school. He recalled that in 1919 he had been one of a number of "rather battered and weary men" who had been given not only an opening for research but also their bed and breakfast at the London Hospital. If the chief end of education was to enable men to live together in kindliness he had found much valuable training in the old hostel, in the dining room and in the common room. In the physiological department, where he worked under Prof. E. P. Cathcart, there was a gas stove which did not smell, and round it they had sat for hours discussing everything in heaven and earth. Not a moment had been wasted; but "don't expect to take any prizes," he told the students, "if you live in a hostel." Some further account of Mr. Elliot's address will be found on p. 96).

Prof. William Wright, the dean, on reviewing the year, referred to the death, among others, of Dr. Arthur Lewers, Mr. Frank Kidd, Dr. George Jones, and Mr. Henderson Whyte. By resignation the school was losing or had lost such old friends as Dr. Robert Hutchison, Prof. William Bulloch, Dr. Paul Fildes, F.R.S., and Dr. A. B. Bratton. Dr. S. P. Bedson would succeed to Dr. Bulloch's chair, Dr. Horace Evans and Dr. William Evans had been appointed assistant physicians, and Mr. A. M. A. Moore was now assistant surgeon. After speaking of the public distinctions of the year, Prof. Wright said that athletics had shown more promise than performance, but B. H. Page had beaten the inter-hospital record for the mile. In conclusion he emphasised the importance of the new hostel (described in last week's LANCET) in the life of the hospital.

A vote of thanks to Mr. Walter Elliot was proposed by Sir William Goschen, chairman of the hospital, and seconded by Dr. Cecil Wall, who gave some account of the history of the medical college.

Papworth Village Settlement

The annual meeting of this settlement, established near Cambridge, will be held at the Park Lane Hotel, London, W., on Wednesday, July 11th, at 4.30 P.M., when Sir Humphry Rolleston will preside, and the speakers will include Sir Francis Fremantle, M.P., and Sir Pendrill Varrier-Jones, the medical director. The Duke of Gloucester is visiting the settlement on July 26th to inaugurate the new Bernhard Baron Memorial Hospital and lay the foundation-stone of the surgical block.

Society for Relief of Widows and Orphans of Medical Men

A meeting of the court of directors was held on July 4th, with Dr. W. Culver James, senior vice-president, in the chair. The death of a member was reported, and two new members were elected. The sum of £2285 was voted for the payment of the half-yearly grants to the 54 widows and eight orphans in receipt of relief. This sum includes £105 as special grants to assist orphans in their studies for professional or business careers. A letter was read from a widow expressing her gratitude to the society for the help she had received to enable her son to qualify as a doctor. She had received for this purpose, for the past five years, 25 guineas a year. Membership of the society is open to registered medical men who at the time of their election are residing within a 20-mile radius of Charing Cross. Relief is granted only to the widows or orphans of deceased members who are left in indigent circumstances. Full particulars may be obtained from the secretary of the society, 11, Chandos-street, Cavendish-square, London, W. 1.

Fellowship of Medicine and Post-Graduate Medical Association

Dr. Clark-Kennedy will give a lecture demonstration at the Medical Society of London, Chandos-street, Cavendish-square, W., on Tuesday, July 17th, at 2.30 P.M., on diseases of bone, and on July 24th he will deal with rheumatism. With the exception of Tuesday, August 7th, these lecture demonstrations will continue throughout August. Dr. Kenneth Harris is giving two demonstrations at the Medical Society of London on Wednesday, July 18th, and Thursday, July 19th, at 4.30 P.M. From August 13th to 17th Mr. Alan Gairdner will give demonstrations on the treatment of recent and old fractures daily at 2.30 P.M. The first two demonstrations will deal with fractures of the upper extremity, the third with fractures of spine and pelvis, and the last two with fractures of the lower extremity. The secretary of the Fellowship may be addressed at 1, Wimpole-street, London, W.1.

Prize Day at St. Thomas's Hospital

On June 26th Lord Derby distributed the prizes to the students at St. Thomas's Medical School, on which occasion Sir Cuthbert Wallace, consulting surgeon to the hospital, received on behalf of the hospital and school a bronze bust of the late Sir George Makins. The bust, executed by Mrs. Bromet, is a replica of one in the Royal College of Surgeons of England, and will be placed at the head of the grand staircase in the hospital. It was mentioned that Sir George Makins's banner from the Chapel of the Order of St. Michael and St. George would be placed in the hospital chapel. Sir Arthur Stanley, treasurer, informed the gathering that one-half of the work of reconstruction of the out-patient department.—namely, the medical block, had been completed. Prof. Leonard Dudgeon, dean of the school, said that the success of the school was due, at least in part, to the close 'coöperation between it and the hospital, and mentioned, but without giving names or details, that in the near future there might be a movement in medical education in London, which would affect for the better the medical school of St. Thomas's and two other large teaching hospitals.

Medical Diary

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.

MONDAY, July 16th to SATURDAY, July 21st.—HOSPITAL FOR DISEASES OF THE SKIN, Blackfriars-road. Afternoon Course in Dermatology.—ALL SAINTS HOSPITALS, Austral-street, West-square, S.W. Afternoon and evening Course in Urology.—MEDICAL SOCIETY OF LONDON, 11, Chandos-street, W. Tues., Lecture-demonstration by Dr. A. E. Clark-Kennedy at 2.30 P.M. on Diseases of Bone. Wed., demonstration of Electro-cardiograms, by Dr. Kenneth Harris, at 4.30 P.M. (Specially suitable for M.R.C.P. candidates.) Thurs., demonstration of Electro-cardiograms, by Dr. Kenneth Harris, at 4.30 P.M. (Specially suitable for M.R.C.P. candidates.)—PANEL OF TEACHERS. Individual clinics in various branches of medicine and surgery available daily.—Courses of instruction arranged by the Fellowship of Medicine are open only to Members and Associates.

UNIVERSITY OF BIRMINGHAM.

TUESDAY, July 17th.—3.30 to 5 P.M. (at the General Hospital), Mr. Stirk Adams: Examination of the Nose, Throat, and Ear in Practice.

FRIDAY.—3.30 to 5 P.M. (at the Queen's Hospital), Mr. D. J. Evans: Common Affections of the Nose.

Vacancies

For further information refer to the advertisement columns.

Bath, Royal United Hospital.—Out-patient and Cas. O. at rate of £150.

Birmingham, Queen's Hospital.—Res. Med. Reg. £200.

Birmingham Royal Cripples Hospital.—H.S. At rate of £350.

Birmingham University.—Reader in Industrial Hygiene, &c. £800. Also Two Part-time Tutors in Dept. of Midwifery, &c. Each £50.

Bradford City.—Asst. School M.O. £500.

Brighton, Royal Alexandra Hospital for Sick Children.—H.S. £100.

Brighton, Royal Sussex County Hospital.—H.P. and H.S. Each £150. Also Cas. H.S. £120.

Bristol, Children's Orthopædic Hospital and Sanatorium, Frenchay Park.—R.M.O. £250.

Bristol Royal Infirmary.—H.P.'s, H.S.'s, &c. Each at rate of £80. Also Cas. H.S. At rate of £100. Also Hon. Obstetrician, Hon. Asst. Anæsthetist. Also Med. Reg.

Bury St. Edmunds, West Suffolk County Council.—Asst. County M.O. and Asst. School M.O. £500.

Chelsea Hospital for Women, S.W.—Clin. Assts. for Out-Patients' Dept.

Chester, Royal Infirmary.—One H.P. and two H.S.'s. Each £150.

Chesterfield and North Derbyshire Royal Hospital.—H.S. At rate of £150.

City of London Hospital for Diseases of the Heart and Lungs, Victoria Park, E.—H.P. At rate of £100.

Colchester, Essex County Hospital.—H.P. £150.

Connaught Hospital, Walthamstow, E.—H.P. At rate of £100.

Derby, Derbyshire Royal Infirmary.—H.S. for General Surgery and Gynæcology. £150.

Dewsbury and District General Infirmary.—Hon. Visiting Surgeon.

East Grinstead Urban and Uckfield Rural Districts.—M.O.H. £800.

Edmonton, North Middlesex County Hospital.—Res. Asst. M.O. £400.

Evelina Hospital for Sick Children, Southwark, S.E.—H.S. At rate of £120.

Exeter, Royal Devon and Exeter Hospital.—H.P. Also H.S. to Ear, Nose and Throat Dept. Each at rate of £150.

Gloucester, Gloucestershire Royal Infirmary, &c.—Hon. Ear, Nose, and Throat Surgeon.

Halifax, St. Luke's Hospital.—Med. Supt. £800.

Hampstead General and North-West London Hospital, Haverstock-hill, N.W.—H.P. At rate of £100. Also Cas. Surg. O. for Out-patient Dept. At rate of £100.

Hastings, Royal East Sussex Hospital.—Jun. H.S. At rate of £150.

Hospital for Sick Children, Great Ormond-street, W.C.—Three Out-patient Surgical Registrarships. Each £200.

Hospital of St. John and St. Elizabeth, 60, Grove End-road, N.W.8.—Res. H.P. At rate of £100.

Huddersfield Royal Infirmary.—Cas. O. and H.P. £200 and £150 respectively.

Hull Royal Infirmary.—Cas. O. Also third H.S. Each at rate of £150.

Ipswich, East Suffolk and Ipswich Hospital.—H.P. £120.

King Edward Memorial Hospital, Ealing.—Jun. Res. M.O. At rate of £150.

Leeds City.—Deputy M.O.H. £900.

Lincoln County Hospital.—Jun. H.S. At rate of £150.

Liverpool, Royal Babies' Hospital, Woolton.—Two Hon. Physicians. Also Res. M.O. At rate of £90.

Liverpool, Royal Liverpool Children's Hospital, Myrtle-street.—Res. Cas. O. £250. Also Two Res. H.P.'s, and Two Res. H.S.'s. Each at rate of £100. For Heswall Branch, Res. M.O., and Res. Surg. O. Each at rate of £120.

Liverpool, Royal Southern Hospital.—Two H.P.'s, Three H.S.'s, M.O. to Special Depts., and Res. Anæsthetist. Each at rate of £60. Also Res. Cas. O. At rate of £100.

Liverpool University.—Research Asst. to Prof. of Medicine.

Manchester, Ancoats Hospital.—H.S. to Special Depts. Also H.P. Each at rate of £100. Also Surg. Reg.

Manchester Hospital for Consumption and Diseases of the Throat and Chest.—Res. M.O. for In-Patient Dept., Bawdon, Cheshire. £200.

Manchester, Royal Eye Hospital.—Jun. H.S. £120.

Manchester, St. Mary's Hospitals.—Asst. M.O. At rate of £150.

Middlesex C.C.—District M.O. for Friern Barnet South. £100.

Near Pontefract, Ackworth School.—Part-time M.O.

Newcastle-upon-Tyne, Hospital for Sick Children.—H.P. and H.S. At rate of £100. Also Res. Surg. O. £250.

Newcastle-upon-Tyne, Royal Victoria Infirmary.—Registrar to Orthopædic Dept. £150.

Norwich City.—Asst. M.O.H., &c. £500.

Norwich, Norfolk and Norwich Hospital.—H.S. to Spec. Depts. £120.

Penarth, Llandough Hospital.—Jun. Res. M.O. At rate of £100.

Peterborough City, Maternity and Child Welfare Service.—Clin. M.O.

Preston, Biddulph Grange Orthopædic Hospital.—Sen. and Jun. H.S.'s. At rate of £250 and £150 respectively.

Preston, County Mental Hospital, Whittingham.—Jun. Asst. M.O. £500.

Preston, Sharoe Green Hospital.—Jun. Asst. Res. M.O. At rate of £100.

Princess Elizabeth of York Hospital for Children, Shadwell, E.—Dermatologist.

Reading, Battle Hospital.—Asst. Res. M.O. £300.

Royal College of Physicians, Pall Mall East, S.W.—Prophit Scholarship. £500.

Salford Royal Hospital.—H.P. At rate of £125.

Sheffield Royal Hospital.—Surg. Reg.

St. Bartholomew's Hospital, London, E.C.—Wholetime Reg. in Cancer Dept. £500.

St. John's Hospital, Lewisham, S.E.—Hon. Surg. Also H.P. and Cas. O. At rate of £100.

St. Mary's Hospital, W.—Physician for Diseases of the Skin Dept

Sheffield Children's Hospital.—H.S. Also H.P. Each at rate of £100.

Sheffield Royal Hospital.—Ophth. H.S. £120.

Shrewsbury, Royal Salop Infirmary.—Cas. O., and Res. Anæsthetist. At rate of £160.

South Eastern Hospital for Children, Sydenham, S.E.—Jun. Res. M.O. At rate of £100.

Southend-on-Sea General Hospital.—Res. Obstet. and Gynæcological O. At rate of £125.

Stockport Infirmary.—Res. Surg. O. and H.S. £250 and £150 respectively.

Stoke-on-Trent, North Staffordshire Royal Infirmary.—Asst. H.P. £125.

Swansea General and Eye Hospital.—H.S. At rate of £150.

Swansea Valley, Adelina Patti Hospital, Craig y Nos.—H.P. At rate of £100.

Tunbridge Wells, New Kent and Sussex Hospital.—Sen. H.S. £175.

Virginia Water, Holloway Sanatorium.—Jun. Asst. M.O. £350.

Victoria Hospital for Children, Tite-street, Chelsea, S.W.—H.P. and H.S. Each at rate of £100.

Warrington Infirmary and Dispensary.—Third Res. H.S. £150.

Weir Hospital, Grove-road, Balham, S.W.—Jun. Res. M.O. £150.

Willesden General Hospital, Harlesden-road, N.W.—Hon. Phys. to Skin Dept.

Wimbledon Hospital, Thurston-road, S.W.—Res. M.O. £105.

Wolverhampton Royal Hospital.—H.S. and H.S. for Orthopædic and Fracture Dept. Each at rate of £100.

The Chief Inspector of Factories announces the following vacant appointments for Certifying Factory Surgeons: Crowborough (Sussex), Uckfield (Sussex), Newton Stewart (Wigtownshire), and at Loughton (Essex).

Medical Referee under the Workmen's Compensation Act for Gateshead, &c. Application should be made to the Home Office, Whitehall, London.

Births, Marriages, and Deaths

BIRTHS

ADAM.—On July 7th, at Tighmholrinn, Crowborough, the wife of Dr. W. B. Adam, of a daughter.

DRUCE.—On July 2nd, at Cliff View, Reigate-road, Reigate, the wife of G. R. Druce, L.D.S. Eng., of a daughter.

MARSHALL.—On July 3rd, at Devonshire-place, W., the wife of Dr. R. M. Marshall, of Brockenhurst, of a daughter.

PULVERTAFT.—On July 3rd, at Bentinck-street, W., the wife of Dr. R. J. V. Pulvertaft, of a daughter.

STEVENS.—On July 4th, at Woolpit, Suffolk, the wife of Dr. Norton Stevens, of a son.

MARRIAGES

HART—SPENCER.—On July 5th at Bournemouth, Dr. J. W. Hart of Measham, Leicestershire, to Marion G. Spencer.

DEATHS

FOWLER.—On July 3rd, Sir James Kingston Fowler, K.C.M.G., K.C.V.O., in his 83rd year.

JAMES.—On July 6th, at Croydon, as the result of gas poisoning incurred during the Great War, Philip William James, M.C., M.D.

NEILD.—On July 4th, suddenly, at Richmond-hill, Clifton, Bristol, Newman Neild, M.B., Ch.B., F.R.C.P., aged 62 years.

ROSS.—On July 4th, at The Crescent, Kingsland-road, E., David Ross, M.D., aged 62.

N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.

NOTES, COMMENTS, AND ABSTRACTS

CONVALESCENCE ON THE COAST *

ACCELERATING AND RETARDING CLIMATES

BY R. FORTESCUE FOX, M.D., F.R.C.P.

ANYONE who studies the fascinating subject of medical climatology soon discovers that there are two main kinds of climates from a health point of view. Climates of the first kind, of which the eastern region of Great Britain furnishes perhaps the best known example, are mainly although not entirely powerful stimulants. They operate on both body and mind, by tuning or toning up the whole organism. Climates of the other kind exert an action in the contrary direction. They are soothing and sedative, and have often been described as relaxing, which is a word that is greatly misunderstood. They actually operate by lessening the activity of irritable and overworked functions and, as with a musical instrument, they reduce the tension and tune or tone down the whole organism. Bracing and relaxing are misleading words to apply to these different types of climate. Stimulant and sedative are more accurate; and as the processes of life and disease are often a question of pace or speed, they might well be called *accelerating* and *retarding* climates.

One of the great facts in physical medicine is that corresponding with these two different kinds of external influence there are two main types of ill-health. These are first the troubles that are best served by accelerating or toning up: in which we find languid functions, depression of body and of mind, or failing nutrition and poor development in children. These are the troubles which often find a remedy in the eastern and south-eastern airs. Then there are the troubles of ill-health that are best served by soothing surroundings: failing powers, premature degenerations, in the heart or kidneys, breathing apparatus, or nerve centres—maladies that come from asking too much. In these cases we seek to reduce nervous and organic expenditure, diminish tissue activities, remove irritation and pain and dangerous tension, so as, if possible, to restore disturbed functions. We seek to prolong life by retarding the pace. This can very often be accomplished in the sedative airs of the south-west and north-west.

Thus we have on the one side of the country an Atlantic influence favourable to the maladies of age, and on the other an Eastern influence favourable for the young, although this can be said only in a general way, for some sensitive children are best in a soothing air, and many old people derive benefit in the summer season from the tonic air of the east. Again there is the great group of maladies—the breakdowns of middle life which can be very well treated, according to individual characters, at health resorts both east and west. In this class of case, which appears to be increasing with the strain of modern life, the selection of retarding or accelerating climates as well as of appropriate spas is a matter of great medical importance.

THE MOVEMENT TO THE SEA

One of the most remarkable international social movements of the present day is the movement to the sea. It is perhaps an instinctive feeling for Nature after the late war and a reaction from the dull and crowded life of the cities. The exodus from the cities to the sea is unparalleled. It is seen in Australia, South Africa, and Canada, on the coast of New Jersey and in Argentina, where new branches of railway have been built to carry the increased traffic, and in all maritime European countries. At 24 British seaside health resorts there was a total of more than 7¾ millions of visitors in 1933, and the number of sea baths taken at 30 bathing resorts is stated at nearly 6 millions. To provide this popular bathing for pleasure, recreation, and sport the number of swimming pools and sunbathing terraces is constantly increasing. So world-wide a social development has come to stay.

Side by side with this popular movement there is a new *medical study of the sea* which began almost within living memory. Earlier efforts had been made but in the year 1860 the city of Paris first sent 21 "scrofulous" children to a home at St. Malo. In a few years marine hospitals or sanatoria were opened on the coast for delicate children, or in the French phrase the "disinherited of life." The same is true of Germany where Beneke, in 1880, opened on the island of Föhr on the other side of the North Sea his great work for the children of Hamburg and Berlin. Holland and Belgium have many smaller places. And now, according to the latest report, Signor Mussolini is aiming to send 500,000 children every year to the seaside, to marine hospitals, or, what is often better, marine colonies and camps. The convalescence of adults has also been more accurately studied following the experience of the great convalescent camps in the war. In New York City there has been established a fine system for the care of convalescents from the hospitals and serious efforts are being made to bridge the gap between illness and health, the neglect of which in all countries has led to so much industrial incapacity and invalidism.

In England very fine work is being done but the results are seldom published. On the Norfolk and Suffolk coasts alone there are some 670 beds for children and adults. England led the way nearly 100 years ago in the establishment of convalescent homes, and also in providing for convalescent soldiers. Those who are in touch even with small and unpretentious seaside homes have been astonished at the results seen in feeble and delicate children, quite apart from the tuberculous. In a few weeks there is often a change that is almost a resurrection. But the existing work touches only a fringe of the problem. There remains a great unexplored field in the medical care and treatment both of children and convalescents at the seaside, which if it were cultivated might bear fruits of immense value to the public health. That is why the British Health Resorts Association regards the seaside health resorts as an undeveloped national asset and is anxious to make the most and best of these potential health centres.

FURTHER DEVELOPMENTS

Two events have recently given an impetus to the study of the various forms of delicacy in children (non-tuberculous) at the seaside. Some five years ago an international journal, the *Cure Marine*, was founded by Dr. Delcroix who had experience of more than 30 years at a marine sanatorium in Belgium. He based this new effort on the claim that medicine has so far failed to destroy the germs of disease in the body; that hygiene cannot guarantee a pure atmosphere in towns; that phototherapy cannot replace fresh air; that it is still necessary to have recourse to ideal surroundings; and that the curative properties of Nature must be put on a rational basis. The second event was in 1931 when Dr. Häberlin, a successor of Dr. Beneke at the convalescent centre on the island of Föhr, gave a full account of his work at the annual meeting of the British Medical Association at Eastbourne. In connexion with this meeting a questionnaire was issued to medical officers of health on the British coasts, requesting information as to the existing facilities for the treatment of delicate children and the results obtained. The replies received to this questionnaire would form a basis for further studies.

This conference has evoked clear expressions of opinion that the curative values of the coastal health

* From an address delivered at the conference of the British Health Resorts Association held at Cromer on June 30th.

resorts ought to be systematically developed; that they should be made available for all sections of the population; that there should never be the "hard choice," as Dr. W. J. E. Sumpter has remarked, "between the bottomless purse and the bottomless pit." Suggestions have been again put forward that it would be well to stimulate local authorities to provide approved facilities for physical treatment for convalescents; also that shelters and pavilions would be of great advantage in providing against the vicissitudes of one of the most energising climates in the world, and would tend to lengthen the season for visitors at many seaside places. Finally the suggestion has been made that in order to develop the medical values of the health resorts, it would be well to invite practitioners on the coast to furnish all possible information and necessary records, showing the effect of climate and sun- and sea-bathing and other physical methods in the treatment of chronic ailments and of convalescence from operation and illness.

ANIMALS IN THE HANDS OF THEIR FRIENDS

AN increasing number of people mean well towards animals, but good intentions are not always backed with a sound knowledge of how to care for them, and when necessary, to kill them humanely. The Animal Defence Society was responsible last year for organising a conference on humane and inhumane methods of destroying animals, which was attended by representatives of 27 societies and institutions. Astonishingly divergent opinions were expressed upon the best ways of destroying small domestic animals, and the report is illuminating chiefly in showing how little is really known about euthanasia. Chloroform, with or without previous injections of morphia carbon monoxide obtained from coal gas or the exhaust fumes of cars, prussic acid, electrocution, all had strong advocates and equally plausible detractors. From such a turmoil of opinion it is impossible to pick out the ideal method of destroying cats and dogs. Certainly more than one person allowed the wish to be father to the thought, notably the lady who wrote in all sincerity: "Of strychnine the dog is fairly unaware, but the struggles are pitiful to witness." We have the evidence of those who have recovered from strychnine convulsions to refute this optimistic verdict, but no one has returned from the electric chair to tell us how electrocution felt. Many speakers considered the use of illuminant gas or exhaust gas—even when purified by passage through water—unnecessarily cruel because they are said to assault the animal's sense of smell. Curiously enough, no one mentioned this as an objection to chloroform, pungent enough to humans and surely anathema to the dog. Nor was any mention made of the possible effect on the conjunctiva of finely divided chloroform sprayed into a lethal chamber; this method of destruction, however (the Battersea system), was disapproved on other grounds.

The only way of killing dogs which received anything like general support was shooting; but it was agreed that many people objected to this on æsthetic grounds.

The problem of humane destruction is notoriously difficult, but this report does not begin to attack it. At the conference, admirable in its purpose, there was evidently too much feeling and not enough thinking. Personal impressions far outweighed the volume of accurate evidence produced. We are all anxious to find a way of killing animals humanely; and the first thing to do is to collect accurate and detailed statistics showing the results, over a large series of cases, of every method advocated. Until we have that information before us, we can hardly afford to be dogmatic.

WOMEN'S HOLIDAY FUND

WE have received an appeal on behalf of this fund signed by the Bishop of London, the Dowager Countess of Leven, Sir George Blacker, the Rev. Father Devas, the Rev. J. Scott Lidgett, and Mrs. Alfred Loder, chairman of the executive committee. The fund, which helps the women of poor and crowded districts to obtain a holiday, often saves them from that complete breakdown in health, which has such grave consequences in places where poverty rules. Last year 1188 women and 552 children were sent by the fund on a fortnight's holiday. Two pounds represents a fortnight's holiday for one of these poor people, the recipients' contributions providing the remainder of the sum required. Donations should be sent to the secretary of the fund, 76, Denison House, 296, Vauxhall Bridge-road, London, S.W.1.

ZOSTER AND VARICELLA

Dr. J. BRUCE MACKAY writes: "Alice K., aged 7 years, was brought to me on May 3rd, 1934, because of a rash on the upper left chest. This was a herpes zoster, and had appeared on May 2nd. The mother, on being questioned as to contact with any cases of chicken-pox later, told me that the child's grandfather, aged 65, was diagnosed as suffering from severe "shingles" of the chest on April 27th by his own doctor. She denied any possibility of contact between Alice and the grandfather. George K., aged 5½ years, a brother of Alice, was brought to me on May 17th suffering from chicken-pox, the first spots appearing on the 15th. The mother has since told me that June K., aged 3, a sister, developed chicken-pox on the 17th. The mother admitted that both George and June went daily to the grandfather's house, but again said she was sure Alice never went there."

Appointments

CLOAKE, P. C. P., M.D., B.S. Lond., has been appointed Prof. of Medicine, University of Birmingham.

EVANS, WILLIAM, M.D. Lond., M.R.C.P. Lond., Honorary Assistant Physician and Assistant Director of the Medical Unit of the London Hospital.

MCQUEEN, J. G. S., M.D., Ch.B. Edin., D.P.H., Asst. Medical Officer of Health, West Bromwich.

WATSON, RALPH, M.B. Camb., D.P.H., Medical Officer of Health to the Borough of Doncaster.

London County Council Hospital Staff.—The following appointments, promotions and transfers are announced. (A.M.O. (I.) and (II.)=Assistant Medical Officer, Grades I. and II.)

WEBB, C. H. S., M.S. Lond., F.R.C.S. Eng., Senior A.M.O. II., St. James.
BEGG, N. D., M.D. Aberd., D.P.H., A.M.O. II., North-Eastern.
GABE, J., M.B. Lond., F.R.C.S. Eng., Senior A.M.O. II., St. Peter's.
WESTWATER, J. S., M.D. Edin., D.P.H., Senior A.M.O. II., North-Western.
WATSON, A. J., M.B. Lond., F.R.C.S. Eng., Assistant A.M.O. I., St. Giles'.
PRIEST, W. M., M.D. Lond., A.M.O. I., St. Mary Abbots.
NIVEN, J. C., M.B. Aberd., A.M.O. II., Hackney.
FLATLEY, G. D., M.B. Belf., A.M.O. II., Mile End.
BAGOT, F., M.B. Manch., A.M.O. II., Paddington.
DOODY, P. J., M.B., N.U.I., A.M.O. II., St. Nicholas.
O'RIORDAN, J. D., M.D. N.U.I., A.M.O. II., St. Peter's.
VAN LANGENBERG, E. R., M.R.C.S., A.M.O. II., St. Mary, Islington.
MALK, M., M.R.C.S. Eng., A.M.O. II., St. Stephen's.
HAMILTON, R. J., M.R.C.S. Eng., A.M.O. II., St. Mary Abbots.
CAMPBELL, R. M., M.R.C.S. Eng., House Physician, St. Leonard's.
TISDALL, G. E. H., M.R.C.S. Eng., House Physician, Dulwich.
SVENSSON, R., M.B. Camb., Clinical Assistant, St. Stephen's.
BANKS, M. H., M.R.C.S. Eng., House Physician, Lewisham.
EDHOLM, O. G., M.R.C.S. Eng., Clinical Assistant, Fulham.

LEBANON HOSPITAL FOR MENTAL DISEASES.—The vacancy caused by the death of Dr. Henry Watson Smith, medical director of this international voluntary hospital near Beirut, has been filled by the appointment of Dr. R. Stewart Miller, late medical director of the Khanka Mental Hospital, Cairo. Dr. Miller retired from this post a year ago under the agreement whereby British civil servants were to be replaced by Egyptians.